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BY THE COMPTROLLER GENERAL

Report To The Congress

OF THE UNITED STATES

COMPLETED

Increasing Commuting By Transit And Ridesharing: Many Factors Should Be Considered

ORIGINAL

Following the 1979 gasoline shortages, the Department of Transportation proposed a program to expand mass transit capacity and to increase transit commuting by 50 percent. The Department also set a goal of doubling the number of people who commute in carpools and vanpools (ridesharing). Increasing transit commuting through capacity expansion can be costly in terms of transit operating costs, deficits, and subsidies, and obstacles will have to be overcome to achieve the carpool/vanpool commuting goal.

This report provides the Congress with information to use when it considers legislative and funding proposals directed at increasing commuters' use of mass transit and ridesharing.

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NOVEMBER 14, 1980

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COMPTROLLER GENERAL OF THE UNITED STATES
WASHINGTON, D.C. 20548

B-199857

To the President of the Senate and the
Speaker of the House of Representatives

This report discusses efforts to increase commuter use of transit and ridesharing and presents matters for consideration by the Congress regarding mass transit expansion and Federal funding for ridesharing.

Copies of this report are being sent to the Director, Office of Management and Budget; the Secretary of Transportation; the Secretary of Energy; the Administrator of the Environmental Protection Agency; interested congressional committees; and other parties.

Sincerely yours,

Comptroller General
of the United States

B

COMPTROLLER GENERAL'S REPORT TO THE CONGRESS

INCREASING COMMUTING BY TRANSIT AND RIDESHARING: MANY FACTORS SHOULD BE CONSIDERED

D I G E S T

In the name of energy efficiency and conservation, the Secretary of Transportation proposed a program to expand mass transit capacity and transit commuting. Also, the Secretary proposed a new funding source for ridesharing as part of the Department's efforts to double the number of commuters who carpool and vanpool. These proposals would be financed by revenues from the oil windfall profits tax.

When deciding on authorizations and appropriations for transit expansion, the Congress should consider the potential effects of expansion on operating costs, deficits, and subsidies. Also, the Congress should consider providing separate Federal funding for ridesharing programs, rather than relying on the diversion of Federal-aid highway funds by State and local governments.

TRANSIT EXPANSION

The Department of Transportation is advocating a combined Federal and local 10-year capital investment in mass transit of about $53 billion to increase transit capacity and ridership by 50 percent by 1990. For fiscal years 1980-85, a $16.2 billion increase in the urban area mass transit grant authorization to $27.3 billion has been requested.

Transit capacity expansion can provide benefits in terms of less congestion and pollution, employment opportunities, and urban revitalization. However, GAO is concerned that the decision to support transit expansion is being unduly influenced by the energy situation and the availability of windfall profits tax revenues and that not enough consideration has been given to potential adverse impacts of transit expansion on transit operating costs, deficits, and subsidies.

CED-81-13

Tear Sheet. Upon removal, the report cover date should be noted hereon.

GAO's concerns are based on the following:

--Annual energy savings from a 50-percent increase in transit commuting will be quite small. (See pp. 11 and 12.)

--Increased transit capacity is needed primarily to accommodate commuters during small portions of morning and evening commuting periods. During these periods transit ridership often meets or exceeds the systems' capacities. Outside of these two peak periods, existing transit capacity can accommodate large increases in ridership. This difference in capacity utilization between the two peak periods and the rest of the day is a major factor in transit operating deficits. (Deficits have grown from $288 million in 1970 to an estimated $2.3 billion in 1978.) Adding more capacity could widen the difference in capacity use and contribute to increasing operating deficits. (See pp. 15 and 16.)

--Increased transit commuting and attendant energy savings are possible without expanding present physical capacities if drive-alone commuters could be motivated to use transit outside of peak periods. Staggered working hours, higher fares for riding in the full-capacity period, strong incentives for commuting by transit, and disincentives against driving alone are actions that might be needed to bring this change about. (See pp. 16 and 17.)

--Even with a 50-percent increase in transit capacity and transit commuting, transit's role in work-trip commuting would remain small, and transit would still be unavailable as a commuting alternative for most commuters. (See pp. 17 to 19.)

RIDESHARING

Although the Federal Government has advocated greater use of ridesharing, progress has been slow in getting drive-alone commuters to switch to ridesharing. (See pp. 25 to 31.)

Except for some direct funding of demonstration projects, Federal funding of ridesharing activities generally has been limited to the use of Federal-aid highway funds. Through fiscal year 1979, only $28.6 million was used for carpooling. Use of Federal mass transit formula grants for ridesharing was recently authorized but has been very limited. State and local governments have been reluctant to use these funds for ridesharing because doing so takes funds away from conventional highway and transit projects that have strong local support. (See pp. 39 to 42.)

GAO believes that the Congress should support separate Federal funding of ridesharing activities because:

--Ridesharing is the only practical alternative to driving alone for most commuters. (See pp. 17 to 19.)

--If serious gasoline shortages occur, ridesharing would have to become the predominant commuting mode.

--Doubling ridesharing would save at least three times as much energy as a 50-percent increase in transit commuting and would have a greater impact on congestion and pollution. Also, it would use the available space in automobiles already on the road. (See pp. 44 and 45.)

--Separate Federal funding for ridesharing should help overcome State and local government reluctance to fund these activities because, at the local level, ridesharing activities would not be competing for Federal funds with the more conventional highway and transit projects. (See pp. 39 to 42.)

--The widespread availability of ridesharing assistance and incentives would help reduce drive-alone commuting. (See ch. 4.)

AGENCY COMMENTS AND GAO's EVALUATION

The Departments of Transportation (DOT) and Energy (DOE) and the Environmental Protection Agency (EPA) commented on this report.

Tear Sheet

Transit expansion

The three agencies generally agreed that the direct energy savings from a 50-percent increase in transit capacity and ridership would be small and that a Federal decision to substantially increase transit capacity should be based on an assessment of the full range of benefits and costs associated with transit expansion. They emphasized that transit capacity expansion would produce a number of benefits aside from energy savings. DOT stated that, in addition to direct energy benefits, transit expansion would contribute indirectly to national energy goals by providing fallback capacity for use in the event of a severe gasoline shortage. DOT said that without some basic level of transit service, ridesharing and auto disincentives would be less politically feasible and less likely to be successful if initiated by State/local government. (See p. 21.)

GAO agrees that transit expansion offers potential for realizing a number of benefits, but it also has the potential for significant adverse impacts on transit operating costs, deficits, and subsidies. GAO's concern is that in reacting to the 1979 gasoline shortages and the availability of windfall profits tax revenues, a major policy decision on transit expansion might be made without fully examining not only the benefits but also the potential adverse impact on transit costs and deficits that could result from expansion. (See pp. 21 to 23.)

Comments on ridesharing

EPA said that ridesharing is a low-capital-cost alternative that can be quickly implemented and that reduces energy consumption and air pollution. (See p. 47.)

DOE said that sound Federal programs to improve commuter vehicle occupancy are needed to achieve national energy conservation goals and that raising the average automobile occupancy for work trips to 2 people could save 10 times as much gasoline as a 50-percent increase in transit commuting. Also, DOE

identified actions which should be taken to increase ridesharing. (See p. 47.)

DOT concurred with GAO's findings that substantial energy and other benefits are possible through increased ridesharing and that additional Federal incentives are necessary to get local governments to implement ridesharing programs. However, DOT preferred an approach that would offer an incentive to local governments to use Federal-aid highway funds for ridesharing rather than categorical funding. DOT further stated that getting drive-alone commuters to switch to ridesharing requires a change in behavior, which occurs slowly unless there is an extraordinary circumstance or major economic incentive. (See pp. 44 and 47.)

GAO does not see any basic disagreement between its views on ridesharing and the views expressed by DOT, DOE, and EPA about the potential benefits of ridesharing and the difficulty of changing human behavior and bringing about a large shift of drive-alone commuters to ridesharing. Also, GAO agrees that the actions suggested by DOE would contribute to increased ridesharing. (See p. 48.)

The basic difference is that GAO believes that categorical funding for ridesharing would hasten the establishment of comprehensive ridesharing programs by local governments and this in turn would accelerate the pace of behavorial changes and shifts to ridesharing. Given (1) the benefits that would accrue from a large increase in ridesharing, (2) the fact that it is the only alternative to driving alone for most commuters and (3) the large role that ridesharing would have to play in the event of serious gasoline shortages, GAO believes that accelerating the establishment of comprehensive ridesharing programs by local governments is desirable. (See pp. 48 and 49.)

Tear Sheet

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ABBREVIATIONS

DOE	Department of Energy
DOT	Department of Transportation
EPA	Environmental Protection Agency
FHWA	Federal Highway Administration
GAO	General Accounting Office
SMSA	Standard Metropolitan Statistical Area
UMTA	Urban Mass Transportation Administration

CHAPTER 1

INTRODUCTION

Following the 1979 gasoline shortages, the Secretary of Transportation, in September 1979, announced that the Department would seek to increase mass transit capacity and ridership by 50 percent. This announcement was followed by another, in February 1980, that the Department, in conjunction with the President's Task Force on Ridesharing, would work to double the number of people who use carpools and vanpools to commute to work.

Federal financial aid for urban mass transportation began in the 1960s. Since it was established in 1968, the Urban Mass Transportation Administration (UMTA) in the Department of Transportation (DOT) has been responsible for managing Federal aid to mass transit. Behind the Federal support for mass transit is the belief that mass transportation can help reduce urban congestion, improve air quality, and conserve energy.

Other forms of ridesharing, such as carpooling and vanpooling, offer another alternative to drive-alone commuting that will help to reduce the urban congestion, air pollution, and energy consumption associated with the private automobile. The 1973 oil embargo generated interest in ridesharing and led to active Federal encouragement of carpooling and vanpooling. Subsequent actions by the Organization of Petroleum Exporting Countries have led to a worsening of our energy situation in terms of a growing dependence on unstable foreign oil sources, disruptions and potential disruptions to gasoline supplies, and escalating foreign oil prices. This worsening situation and the 1979 gasoline shortages provided much of the impetus for the goals DOT established to increase the use of mass transit and ridesharing.

Achieving these goals can be costly, and obstacles to their achievement will have to be overcome. This report gives the Congress information to use when it considers legislative and funding proposals to increase commuters' use of mass transit and ridesharing.

OBJECTIVES, SCOPE, AND METHODOLOGY

The objectives of our work were to identify (1) Federal efforts, since the 1973 oil embargo, to increase commuter use of mass transit and ridesharing instead of driving alone, (2) the changes that have occurred during the 1970s in the relative levels of commuting by transit, ridesharing, and driving

alone, and (3) the obstacles to increased ridesharing and transit commuting. We also wanted to provide the Congress with our viewpoints about recent DOT initiatives toward mass transit and ridesharing that have been taken following the 1979 gasoline shortages.

Our work consisted of discussions with representatives of the Federal Highway and Urban Mass Transportation Administrations, DOT, the Environmental Protection Agency (EPA), and the Department of Energy (DOE) about

--Federal efforts to increase commuters' use of mass transit and ridesharing,

--changes in commuters' use of transit and ridesharing,

--actions and activities that have been tried in urban areas to increase mass transit and ridesharing use, and

--benefits provided by increased mass transit and ridesharing use.

Our discussions were augmented with the analysis of reports, studies, and other relevant data that was made available by representatives of these agencies. We also researched published data and sought information on

--the work trip and how it was and is made, both nationwide and in selected urban areas;

--overall transit ridership data and how it relates to the work trip;

--the effects of increased mass transit and ridesharing use on energy consumption, air pollution, and traffic congestion; and

--why people drive alone.

In addition to the above work, which was performed in Washington, D.C., we also obtained information on the above areas of interest as they relate to selected urban areas. Our work in four urban areas--Boston, Massachusetts; Detroit, Michigan; Los Angeles, California; and Washington, D.C.--included obtaining information from and discussions with representatives of metropolitan planning organizations, transportation agencies, and transit authorities.

The gasoline shortages that occurred during 1979 and the gasoline price increases since early 1979 represent significant changes that have had an impact on transportation actions. However, data is lacking on the nationwide effect that these occurrences have had on the way people commute. Available data focuses on total transit ridership and total roadway use but does not show changes in commuting.

Our assessment in chapter 2 of the energy savings potential of transit expansion focuses on the direct energy savings that can be realized in the more immediate future (that is, through 1990). Some transportation professionals believe that over a longer time period transit expansion can affect the course of future development and land use by encouraging more energy-efficient (that is, higher density) forms of development. However, transportation professionals have differing opinions about the extent to which future land use and development can be influenced through transit expansion. Our discussion of energy savings from transit expansion does not address this possible long-term (beyond 1990) influence of transit expansion on future development and energy use.

CHAPTER 2

TRANSIT EXPANSION: THE NEED FOR DELIBERATION

In September 1979 the Secretary of Transportation proposed to the Congress the Transportation Energy Efficiency Act which called for increased mass transit funding to expand transit capacities by 50 percent to accommodate a 50-percent ridership increase by 1990. The worsening energy situation provided the momentum for this proposal, and the source of the proposed increased funding for mass transit is the Energy Security Trust Fund created from windfall profits tax revenues. Specifically, the proposal, as subsequently revised, calls for a $16.2 billion increase over the $11.1 billion previously authorized in mass transit discretionary and formula grant authorizations for urban areas for fiscal years 1980 through 1985. The requested program levels represent part of a planned 10-year program that will provide a combined Federal and local investment of about $53 billion in transit capital projects.

The switch of automobile commuters, especially drive-alone commuters, to mass transit will reduce the number of automobiles using the roadways during peak commuting periods; as a result, less gasoline will be consumed and less pollutants will be emitted in the work trip. However, because of the relatively small role that transit plays in the work trip, a 50-percent increase in the number of workers commuting by transit will have only a small impact on overall gasoline consumption. Furthermore, even these gasoline savings could be offset if these cars are used for trips that would not have been made if the cars had been driven to work. Also, several factors limit mass transit's role in commuting. These include (1) work-trip peaking, (2) the location of most jobs outside of central cities, and (3) commuter preference for driving alone.

FEDERAL AID TO TRANSIT

From fiscal years 1965 through 1979, the Federal Government granted $12.4 billion for 1,668 transit capital projects and provided operating assistance totaling $2.7 billion. The capital grants have helped pay for some 39,147 buses; 5,350 railcars; the construction of six new subway systems; and numerous rehabilitation, modernization and extension projects on existing rail and bus systems. This Federal aid has been credited with

--allowing for public takeover of unstable transit systems,

--improving the quality of the Nation's mass transit systems by providing funds to modernize and replace facilities and equipment, and

--enabling mass transit services to be expanded.

TRANSIT RIDERSHIP

In 1945 transit ridership--stimulated by nationwide limits on automobile use, extended work weeks, and multiple work shifts--peaked at 23.3 billion total passenger rides. Since then, transit ridership has steadily declined until 1972 when it reached its lowest level at 6.6 billion total passenger rides. Since 1972 transit ridership has increased each year as shown by the following schedule.

Transit Ridership Nationwide
1970-79

Calendar year	Unlinked passenger trips (note a)			Linked passenger trips (note b)		
	Annual ridership	Change from prior year		Annual ridership	Change from prior year	
		Amount	Percent		Amount	Percent
	-----(millions)----			-----(millions)----		
1970	7,332	-471	-6.0	5,932	-378	-6.0
1971	6,847	-485	-6.6	5,497	-435	-7.3
1972	6,567	-280	-4.1	5,253	-244	-4.4
1973	6,660	+ 93	+1.4	5,294	+ 41	+0.8
1974	6,935	+275	+4.1	5,606	+312	+5.9
1975	6,972	+ 37	+0.5	5,643	+ 37	+0.7
1976	7,081	+109	+1.6	5,673	+ 30	+0.5
1977	7,286	+205	+2.9	5,723	+50	+0.9
1978 (note c)	7,616	+330	+4.5	c/5,963	+240	+4.2
1979 (note c)	8,130	+514	+6.7	d/6,365	+402	+6.7

a/Since 1977, unlinked passenger trips is the measurement used, but before 1977 the measurement used was total passenger rides. Total passenger rides is the combined total of all single-vehicle transit rides by (1) first-ride revenue passengers, (2) transfer passengers on second and successive rides, and (3) nonrevenue passengers entitled to transportation without charge. Unlinked passenger trips represent the number of transit vehicle boardings by both originating and transfer transit patrons. This measurement includes charter rides and special rides. Each passenger is counted each time that person boards a transit vehicle regardless of the type of fare paid or transfer presented.

b/Since 1977, linked passenger trips is the measurement used, but before 1977 the measurement used was revenue passenger rides. Revenue passenger rides represent single-vehicle transit rides by initial-board (first ride) transit patrons only. It excludes all transfer rides and all nonrevenue rides. Linked passenger trips are identical to revenue passenger rides except that all originating free-fare passengers are included.

c/Preliminary data.

d/Estimated on the basis of same rate of increase in unlinked passenger trips between 1978 and 1979.

Source: "Transit Fact Book," 1978-79 edition, published by the American Public Transit Association.

Although the above measurements indicate transit ridership changes and trends, they do not indicate the number of workers who commute by transit. This is because these measurements include all ridership and do not break down transit ridership between weekdays and weekends or between weekday peak-commuting periods and weekday off-peak periods. Also, some transit commuters board and pay fares on more than one transit vehicle as part of their work-trip commute and are counted more than once.

TRANSIT AND THE WORK TRIP

The primary source of data on transit use for commuting are surveys by the Bureau of the Census. The most recent nationwide survey covered 1975, and surveys of selected metropolitan areas were made covering 1975, 1976, and 1977. The 1975 nationwide report shows the following:

--In 1970, 66.5 million workers used a vehicle to commute to work, of which 10 percent (6.7 million) used public transit.

--In 1975, 73.8 million workers used a vehicle to commute to work, of which 6.5 percent (4.8 million) used public transit.

Bureau of the Census studies of the work trip in selected metropolitan areas during 1975 (21 areas), 1976 (20 areas), and 1977 (20 areas) show that in the 60 1/ areas surveyed, the percentage of workers using public transportation to commute to work had decreased from that reported in the 1970 decennial census, as shown in the following table.

1/Madison, Wisconsin, was surveyed twice--1975 and 1977.

Changes in the Number and Percentage of Workers Using Public Transportation in Groups of Selected Metropolitan Areas

	1975 Survey (21 areas)		1976 Survey (20 areas)		1977 Survey (20 areas)	
	Number	Percent	Number	Percent	Number	Percent
	(thousands)					
Used transit in 1970	1,811	15.7	2,755	24.3	1,177	10.3
Used transit in survey year	1,432	12.3	2,125	18.7	921	7.3

The 60 metropolitan areas included in these surveys include (according to the 1970 Census) the Nation's 24 largest metropolitan areas and 42 of the largest 50. Of the 60, there was only 1 metropolitan area--the New York metropolitan area--where public transportation was used more frequently for commuting to work than either driving alone or carpooling--48 percent used transit in 1976.

After New York, the metropolitan areas with the highest percentage of public transportation use were as follows.

	Survey year		1970	
Metropolitan areas	Number	Percent	Number	Percent
1975 survey				
Chicago, Ill.	493,000	20.7	654,000	25.6
San Francisco-Oakland, Calif.	212,000	18.1	195,000	16.9
Philadelphia, Pa.	264,000	17.2	385,000	23.1
1976 Survey				
Baltimore, Md.	99,000	12.2	113,000	15.1
Cleveland, Ohio	76,000	11.5	108,000	14.3
1977 Survey				
Boston, Mass.	178,000	19.1	225,000	22.7
Washington, D.C.	178,000	14.8	204,000	17.9

Most public transportation use for commuting occurred in a few large metropolitan areas. For instance:

--Three areas (Chicago, Philadelphia, and San Francisco-Oakland) accounted for about 68 percent of all work trips made by public transportation in the 21 metropolitan areas of the 1975 survey.

--Approximately 78 percent of all public transit work trips made in the 20 metropolitan areas covered by the 1976 survey were made in the New York metropolitan area.

--Three areas (Boston, Washington, D.C., and Los Angeles-Long Beach) accounted for about 54 percent of all public transit commutes made in the 20 metropolitan areas covered by the 1977 survey.

Data is not available that specifically identifies how commuting was accomplished nationwide during 1978 and 1979. The following information on 1978, although it does not specifically relate to commuting, gives some indication of the general level of public transit and automobile use.

--Linked transit passenger trips during 1978 increased approximately 4.2 percent (240 million trips) over 1977, from 5,723 million to 5,963 million trips based on 1978 preliminary data. Even if this entire increase was work-trip related, it would only approximate a shift of about 480,000 workers 1/ (less than 1 percent of all workers).

--Preliminary 1978 data indicates that automobile vehicle miles traveled during 1978 increased by 4.7 percent (52.4 billion miles) over 1977, and average vehicle miles traveled per registered automobile increased from 9,839 to 10,046.

1/Calculated by dividing the increase in linked passenger trips by 500--250 work days per year x 2 (trip to and from work)--to determine the number of round trips per work day. Assumes that all of the increased ridership was work trips and new riders did not ride on more than one transit vehicle.

During the period of gasoline shortages (May through August 1979), nationwide transit ridership increased by about 9.1 percent over the comparable period during 1978. Also during 1979, roadway use changed from comparable 1978 periods as follows.

Roadway Use Changes
Between 1978 and 1979

	Vehicle miles traveled		Changes from 1978 to 1979	
	(billions)			
Month	1979	1978	Amount	Percent
January	107.8	103.5	+4.3	+4.2
February	105.7	102.3	+3.4	+3.3
March	127.9	124.4	+3.5	+2.9
April	127.4	125.0	+2.4	+1.9
May	131.1	133.9	-2.8	-2.0
June	128.9	135.4	-6.5	-4.8
July	132.2	141.2	-9.0	-6.3
August	137.5	142.7	-5.2	-3.6
September	125.9	129.9	-4.0	-3.1
October	129.4	133.4	-4.0	-3.0
November	119.8	122.8	-3.0	-2.4
December	119.6	121.6	-2.0	-1.6
Total	1,493.2	1,516.1	-22.9	-1.51

Source: "Traffic Volume Trends," December 1979 - Federal Highway Administration

The 1979 gasoline shortages and increased gasoline prices apparently had some impact on transit and automobile use. However, it is not possible to tell from this data how commuting was affected nationwide or the extent to which commuting changes made during the gasoline shortages will endure if enough gasoline continues to be available. The 1980 census will provide indications about these changes but will not be available for a while.

If all new transit ridership in 1979, based on preliminary 1979 data, was work-trip related it would, at most, represent a switch of about 800,000 workers to transit--less than 1 percent of total workers. (See footnote on p. 9.)

BENEFITS OF INCREASED TRANSIT COMMUTING

A switch to mass transit by commuters driving alone would reduce the number of automobiles on the road during peak commuting periods; therefore, less gasoline would be consumed and less pollutants would be emitted in commuting.

Because increased transit capacity is needed primarily to accommodate increases in peak-period transit commuting, our calculations of benefits are based on a 50-percent increase in transit commuting. (Large increases in ridership outside of the peak commuting periods could be accommodated with existing capacity.) In 1975, 4.8 million commuters used transit. Assuming that the total increase in transit ridership between 1975 and 1979--722 million linked passenger trips--represented work-trip travel with each work trip being made in a single transit vehicle, 1.4 million 1/ more commuters would have used transit in 1979 than in 1975.

A 50-percent increase by 1990 in the number of commuters using transit in 1979 would result in a switch of 3.1 million 2/ new commuters to transit. The following calculations reflect the annual benefits to be achieved in 1990 resulting from this increase. The estimates of benefits assume that

--the 3.1 million additional transit commuters will have switched from driving alone,

--the automobile left behind will not be used to make any other trips that would not have been made if the automobile were used for commuting,

--the new transit commuter will not drive to a transit pickup point, and

---

1/722 million ÷ 500 (250 work days x 2 trips) = 1.4 million.

2/4.8 million + 1.4 million = 6.2 million x 50% = 3.1 million.

--no additional fuel will be consumed by transit to carry these new transit commuters.

As a result of these very optimistic assumptions, the following represent very optimistic estimates of the benefits that could possibly be realized by a 50-percent expansion of transit capacity. However, actual benefits are likely to be considerably less than estimated.

Energy savings

If 3.1 million workers presently driving alone to work would use transit in 1990, about 543 million 1/ fewer gallons of gasoline (equal to about 35,421 barrels per day) would be consumed in 1990 than if they continued to drive alone--less than 1 percent (0.65 percent) of the gasoline consumed by automobiles in the United States during 1978.

Because the average fuel efficiency of the automobile fleet has improved each year since 1974 and is expected to continue to improve in the future, an identical shift of drive-alone commuters to transit in an earlier year would save more gasoline annually than the calculated savings for the 1990 work trip. For instance, automobile fleet fuel efficiency in 1975 was 13.53 miles per gallon, but we estimate it will be about 15.55 miles per gallon in 1980 and about 20.2 miles per gallon in 1985. Assuming that the fuel efficiency in 1985 is 20.2 miles per gallon, the shift of 3.1 million drive-alone commuters to transit would save about 637 million gallons of gasoline in 1985 (41,553 barrels per day). The same shift in 1980, at an average fuel efficiency of 15.55 miles per gallon, would save about 827 million gallons (53,947 barrels per day).

If the former single-occupant automobiles have to be driven to transit stops or are used extensively for trips that would not have been made if they had been used to commute, the savings would be considerably less than calculated.

Meeting the Federal fuel-efficiency standards for new cars for 1976 through 1985 will have a much greater impact on energy consumption than increased transit commuting.

1/Calculated based on each of the 3.1 million workers not making 250 round trips of 16.6 miles at an estimated average automobile fuel efficiency of 23.7 miles per gallon.

For instance, compliance with the Federal standards through 1985 will produce about a 68.6-percent improvement in the average fuel efficiency of the U.S. automobile fleet between 1978 and 1990--from 14.06 to an estimated 23.7 miles per gallon based on DOT data. Assuming that new-car fuel efficiency reaches the required 27.5 miles per gallon by 1985, the average fuel efficiency of the U.S. automobile fleet should approach the level of 27.5 miles per gallon by the year 2000 even if new-car fleet fuel efficiency does not increase beyond the 1985 requirement. An average fuel-efficiency rate of 27.5 miles per gallon in the year 2000 will allow us to travel the same number of vehicle miles as in 1978 on only 51.1 percent of the gasoline consumed by automobiles in 1978.

Reduced congestion and pollution

Shifting drive-alone commuters to transit would reduce the number of automobiles used for commuting on a one-for-one basis and help relieve congestion during morning and evening rush hours. Thus, the projected shift of drive-alone commuters to transit would remove about 3.1 million cars from the work-trip commute (equal to about 5.3 percent of the number of cars used to commute to work in 1975).

Along with the reduced congestion, decreasing the number of automobiles in the work-trip commute would result in reduced automobile-emitted air pollutants. No precise way exists to estimate the reduction in pollutants that would result from a specified reduction in automobile use because the amount of pollutants emitted is affected by factors such as vehicle age, type of emission controls, number of starts and stops, operating speeds, temperature, humidity, and barometric pressure.

Federal guidance for estimating emission reduction is provided to the States for preparing the transportation portion of State Air Quality Implementation Plans. Using this guidance, we estimated emission levels of the primary automobile pollutants--hydrocarbons, nitrogen oxide, and carbon monoxide--that would result from a single round-trip commute in 1982 by an average automobile under the following assumptions:

--The round-trip distance is 17 miles, involves a cold start in each direction, and is made at an average speed of 30 mph.

--The temperature is 50 degrees.

The emissions of the three pollutants for this illustrative trip would be as follows.

Pollutants	Estimate emissions in grams for single round-trip commute: 17-mile round trip	Two cold starts	Trip total
Hydrocarbons	22.1	26.6	48.7
Carbon monoxide	338.3	440.0	778.3
Nitrogen oxide	39.1	7.4	46.5

We have used the estimated emissions for the illustrative trip to project emissions that would be avoided by eliminating 3.1 million round-trip automobile work trips. These reductions are shown in the following table.

	Estimates of emission reductions: Hydrocarbons	Carbon monoxide	Nitrogen oxide
	----------(grams)----------		
Emissions per trip	48.7	778.3	46.5
Eliminating 3.1 million automobile work trips	151 million	2,413 million	144 million

To put these estimated emission reductions in perspective, contrast them with the emissions that 52.3 million such illustrative trips would produce (52.3 million is the number of commuters who drove alone to work in 1975). The emissions from the 52.3 million trips would be about

--2,547 million grams of hydrocarbons,

--40,705 million grams of carbon monoxide, and

--2,432 million grams of nitrogen oxides.

The above calculations show the magnitude of the emissions that would be avoided. In actuality, each trip by each automobile would vary from our illustrative trip. In addition to the direct emission reductions that eliminating an automobile trip provides, hydrocarbons and carbon monoxide emissions by the automobiles still making the trips could

also be reduced if enough trips were eliminated to reduce congestion to the point where higher operating speeds and less stop-and-go driving are possible.

Other benefits of increasing transit capacity

Expanding transit capacity would increase the number of commuters that can be carried by transit during peak hours. Outside of the peak hours, however, this increased capacity would add to the considerable unused transit capacity. Expanding transit capacity could also generate increased employment opportunities in transit and related industries and could help to revitalize urban areas.

OTHER CONSIDERATIONS CONCERNING TRANSIT CAPACITY EXPANSION

In addition to the fact that the proposed expansion of transit capacity will not result in large energy savings, other factors should be considered, such as

--work-trip peaking and its impact on transit costs and capacity.

--unavailability of transit for the majority of commuters, and

--commuter preferences for automobile commuting.

Work-trip peaking

Transit system capacities are generally sized for the periods of heaviest ridership, which generally occur during the morning and afternoon commuting periods. During the peak portions of the commuting periods, transit systems often carry passengers in excess of vehicle seating capacities under crowded conditions.

Outside of the morning and evening commuting periods, transit systems have substantial excess capacity and could generally accommodate large increases in ridership. Because transit capacity is considerably underutilized outside of the peak commuting periods, capacity expansion would generally not be needed to accommodate increases in off-peak ridership.

Capacity expansion, therefore, would only be required to accommodate increases in peak transit demand. However, expanding capacity to accommodate increased peak demand adds to the surplus of capacity outside of peak periods.

Unless the expanded peak-hour services could be provided with part-time or split-shift labor, the cost of providing the expanded service is likely to greatly exceed the revenues that can be realized. However, the use of part-time labor has generally been restricted, and labor contracts and practices have tended to limit the use of split shifts through

--restrictions on the number or percentage of total shifts that may be split,

--restrictions on the total length of time that may elapse between the start amd finish of the operator's work day, and

--requirements for premium compensation for split shifts.

Consequently, increasing peak-hour transit service through capacity expansion is likely to add to transit operating deficits.

Transit systems nationwide have experienced increasing operating deficits--from $288 million in 1970 to an estimated $2.3 billion in 1978 (based on preliminary American Public Transit Association data for 1978). A December 1979 DOT study projects the nationwide deficit for 1985 to be $6.67 billion. 1/

The gasoline shortages in 1979 produced increases in transit commuting that put a strain on transit system capacities and generated interest in expanding transit capacity to accommodate this increased interest in transit commuting. However, as noted above, there are significant cost implications in expanding transit capacity to accommodate increased peak-period commuting.

One way to accommodate increased transit commuting without expanding transit capacity is to stretch out the heaviest demand for transit services over a longer time period. For instance, the Metropolitan Washington Council of Governments' energy conservation and management plan estimates that if transit use could be spread evenly over the full commuting period, the transit system could

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1/Assumes yearly increases of 1.5 percent in vehicle miles, 11 percent in expenses per vehicle mile, 7 percent in fares, and 2 percent in ridership.

accommodate a two-thirds increase in demand within its present physical capacity. The plan indicates that the arrival times of workers into the region's central employment area reflect a pronounced peaking between 8:30 and 9 a.m.

We believe the availability of transit capacity outside of the peak hour offers an opportunity to accommodate considerable increases in transit commuting with existing transit capacity. If urban areas could successfully spread commuting time into cities over a broader time period, the need for acquiring increased capacity could be minimized. Staggering work hours on a large scale would probably require many employers and workers to change their work hours with the changes coordinated by local governments. Changed working hours may be perceived as inconvenient by some employers and workers, and they might oppose local governnment attempts to organize the working hours of the central city workforce. Also, widespread staggering of work hours in central cities might make carpooling and vanpooling a little more difficult by reducing matching possibilities.

Another approach would be widespread use of flexible working hours combined with variable fares (that is, higher fares during the peak period) to encourage commuting outoutside of peak periods.

DOT has asked local governments to consider using staggered and flexible work hours to relieve congestion and improve the efficiency of transportation facilities, but it does not offer any direct incentives to the local governments to do so. While staggered working hours have been tried in some areas, peaking continues to be characteristic of commuting in urban areas.

At a minimum, staggered hours would allow transit to play a larger role in commuting during periods of serious gasoline shortages. This role would require establishing emergency staggered work hours for central city employers and employees to evenly spread commuting into the central city over a wider time period (3 hours). Emergency staggered work hours would be activated by State or local governments when serious gasoline shortages occurred and remain in effect for the duration of the emergency.

Unavailability of transit

Mass transit systems have traditionally served central city areas and high-density corridors between central cities

and their suburbs. However, in many urban areas, the low-density, decentralized development that was spurred by widespread automobile ownership has resulted in many jobs locating or relocating outside the central cities. For instance, the census study of the 1975 work trip indicates that only about 36 percent of all workers (about 26.3 million) worked in central cities of their resident Standard Metropolitan Statistical Area (SMSA). The following table shows how these work trips were made.

Residence and Mode of Travel
of Workers Working in Central Cities

Commuting mode	Total		Place of residence					
			Central cities		Suburbs		Nonmetropolitan areas	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
	(thousands)							
Drive alone	15,676	59.7	9,152	56.0	5,965	66.8	559	56.1
Carpool	5,063	19.3	2,671	16.3	2,007	22.5	385	38.6
Mass transit	3,573	13.6	2,674	16.4	862	9.7	37	3.7
Other (note a)	1,955	7.4	1,842	11.3	97	1.1	16	1.6
Total	26,267	100.0	16,339	100.0	8,931	b/100.1	997	100.0

a/Includes workers using bicycles, motorcycles, walking, and working at home.

b/Does not add to 100 due to rounding.

In contrast, the remaining 46.5 million work either in the suburbs (22.8 million) or in nonmetropolitan areas (23.7 million 1/), and only 900,000 (about 2 percent) of these workers use public transportation. In the past, transit has not played a large role in providing service among suburban or nonmetropolitan areas because their low population densities made this service noncompetitive and uneconomical. Likewise, the potential for mass transit

1/Includes about 2.4 million workers who reside in one SMSA but work in another.

to play a much larger role in work trips to suburban and nonmetropolitan locations is likely to remain small. Therefore, carpooling and vanpooling are the only alternatives to driving alone for most of these workers.

Commuter preferences

Getting commuters who drive alone to work to switch to transit is an important factor in achieving a 50-percent increase in transit commuting. Efforts to get commuters to switch from driving alone are discussed in chapters 3 and 4. As discussed in these chapters, no evidence exists that large shifts away from driving alone have occurred. There has been considerable speculation that the increases in gasoline prices that occurred between January 1979 and June 1980 have caused some shifting from drive-alone commuting and that these higher gasoline prices will result in large shifts from drive-alone commuting in the future.

We are not convinced that current gasoline prices by themselves can induce and sustain large shifts from driving alone for the following reasons.

--According to the Bureau of Census study of the 1975 work trip, the mean one-way distance of all drive-alone work trips is 8.3 miles; 68 percent of all drive-alone work trips involve one-way distances of 9 miles or less and another 14 percent are between 10 to 14 miles. At a fuel-efficiency rate of 15.55 miles per gallon (see p. 12) the mean daily round trip of a drive-alone commuter will consume only about 1.1 gallons of gasoline (16.6 ÷ 15.55).

--Improvements in automobile fuel efficiency will minimize the impact of higher per gallon gasoline costs.

CONGRESSIONAL ACTION ON THE INCREASED TRANSIT GRANT AUTHORIZATION

As of October 3, 1980, the Congress had not yet approved any increased authorizations for mass transit discretionary and formula grants to urban areas. The Senate had passed a bill, S. 2720, that would authorize a total of about $27 billion for fiscal years 1980 through 1985. A House bill, H.R. 6417, would authorize a total of about $29 billion for fiscal years 1980 through 1985, but the House has not yet voted on this bill.

CONCLUSIONS

The planned 50-percent increase in mass transit capacity is directed at increasing transit's role in the work trip by providing additional capacity to accommodate a perceived growing demand for transit service in peak commuting hours. The Nation's need to reduce gasoline consumption is being cited as a principal reason why transit capacity should be expanded, and the Energy Security Trust Fund is being advocated as the funding source for this expansion.

Even under the most optimistic assumptions, the amount of gasoline that could be saved through a 50-percent increase in transit commuting is relatively small. But expanding transit capacity will require a large capital investment. Also, because of the peaking nature of transit ridership, expansion is likely to increase annual operating deficits and require larger Government subsidies.

Although the effect of expanding transit capacity on energy conservation will be small, expanding transit capacity can have positive effects on employment, pollution, congestion, and urban revitalization. Because of the substantial costs associated with a large transit capacity expansion, a decision to greatly expand transit capacity needs to be based on the weighing of all costs--initial investment and increased operating costs--against the full range of likely benefits. The decision to expand transit capacity by 50 percent should result from a determination that the benefits to be realized justify the costs.

We are concerned that proposed transit expansion is being unduly influenced by concerns over the energy situation and the availability of windfall profits tax revenues. The potential energy savings alone are not sufficient, in our opinion, to justify the large transit expansion being advocated. We are also concerned that there has not been enough consideration of the potential long-term impact on transit operating deficits and the levels of subsidies that could be needed to offset such deficits.

MATTERS FOR CONSIDERATION BY THE CONGRESS

The Congress needs to consider the full cost impact of a large transit capacity expansion along with the types and magnitude of benefits that are likely to be realized in deciding what level of support, if any, to provide for such expansion.

AGENCY COMMENTS AND OUR EVALUATION

DOT, in its letter dated August 26, 1980 (see app. II), agreed with our conclusion that a 50-percent increase in transit capacity and ridership will not, by itself, save substantial amounts of energy directly. However, DOT stated that it would add two energy-related benefits. First, "additional transit capacity can be expected to alleviate severe mobility restrictions by providing a fallback in the event of severe gasoline shortfalls." Second, "the Department believes that transit investments will contribute to long-run changes in land use and development which could be more energy efficient than present land use patterns." Also, DOT stated that transit improvements (1) reinforce people's willingness to use ridesharing by assuring them that alternatives are available at those times when the carpool/vanpool is not available and (2) make it politically more acceptable for local governments to implement--and easier for individual citizens to adjust to--auto disincentives.

DOE, in its letter dated August 29, 1980 (see app. III), stated that the energy savings from a 50-percent increase in transit ridership would be considerably less than we had estimated because our assumptions are "most optimistic" and that they would be very small in comparison with total automobile gasoline consumption. However, DOE indicated that mass transit provides nonenergy benefits and that long-term energy benefits of better mass transit are important, although difficult to quantify.

EPA, in its letter dated August 18, 1980 (see app. IV), stated that although transit's energy conservation potential may have been oversold, our comparative analysis of transit versus ridesharing underestimates both the value and potential of transit systems. It indicates that the loss of transit systems in major metropolitan areas would create major problems in terms of pollution and congestion.

We agree with the general comments that existing mass transit systems play an important role in urban transportation and that the loss of these systems would create serious problems in terms of pollution, congestion, and mobility. Our report does not question the need for these systems, the need for Federal financial support to sustain present levels of transit services, or the need for Federal financial aid to rehabilitate older transit systems.

Our concern is not with increased funding for transit. We believe that the higher level of funding for transit that windfall profits tax revenues make possible could be used for the maintenance and rehabilitation of existing transit systems that EPA said were "both urgently needed and extremely expensive." This is probably especially true for the older transit systems in the large urban areas where transit has traditionally played a large role.

Our concern is directed at the decision to considerably expand capacities to carry more commuters during the weekday morning and afternoon peak periods. We recognize that transit expansion offers potential for the benefits identified by DOT, DOE, and EPA in their comments, as well as other benefits mentioned earlier in the report. On the other side, however, a large transit expansion is likely to have a considerable impact on transit operations, operating costs, operating deficits, and the level of Federal, State, and local government subsidies. This is likely to happen because current industry labor practices in most urban areas constrain the use of part-time labor and split-shift work schedules. A large expansion of peak services using primarly full-time, straight-shift labor is likely to add operating costs that would greatly exceed the additional revenues that can be realized, thereby adding to operating deficits and requirements for subsidies.

We are concerned that in reacting to the 1979 gasoline shortages and the availability of windfall profits tax revenues, a major policy decision on transit expansion might be made without a full airing of the potential impacts of that decision. Because energy savings possible from the proposed expansion will be quite limited, the urgency of the energy situation and need for energy conservation should not preclude full consideration of the implications of capacity expansion.

We believe that the decision on capacity expansion needs to involve a full examination not only of the potential benefits that expansion offers but also of the potential adverse impact that could result from expansion. To accomplish this, we believe it is critical that the following kinds of questions be addressed as part of the decision process on transit expansion.

1. What will be the impact of the proposed expansion on the ratio between peak and off-peak ridership?

2. To what extent can expanded peak services be provided using part-time of split-shift labor?

3. What will be the impact of increased peak service on transit operating cost, operating deficits, and subsidy requirements?

4. How much in increased operating subsidies are Federal, State, and local governments willing to pay to have more people commute by transit?

5. To what extent can paratransit alternatives such as carpooling and vanpooling be used to accommodate increased commuter interest in an alternative to drive-alone commuting instead of expanding traditional fixed-route, scheduled transit services?

6. To what extent can increased transit commuting be accommodated without capacity expansion through such actions as widespread staggering of work hours in the central cities?

Regarding our concerns about potential increases in transit operating deficits and public subsidies, DOT indicated that it had proposed important reforms to the Congress to restructure UMTA's formula grant program. One of the proposals was to change the apportionment formula to include a performance factor based on the number of revenue miles traveled by transit vehicles. Another was to change the limitation on the amount of formula grant funds that could be used to offset operating expenses from 50 percent of operating deficit to 43 percent of operating expenses in 1982, decreasing gradually to 34 percent by 1985. The third change would provide bonus funds to systems that increased ridership 5 percent or whose ratio of operating revenue to operating expense exceeded the national median of all transit systems.

In our opinion, the proposed reforms would not do much to offset the potential increases in transit operating deficits and public subsidies for the following reasons.

1. The first proposed change could allow a transit system to increase its share of total formula grant funds by simply increasing the number of miles its transit vehicles travel in revenue service. There is no requirement that additional operating costs be offset by additional revenues.

2. Under the second proposed change, many transit systems would be allowed to use a larger portion of their formula funds to offset operating expenses than would be allowed under the 50 percent of

operating deficit limitation. For instance, in 1978, revenues of transit systems nationwide averaged 51.2 percent of total operating expenses. Therefore, under the present limitation, a transit system that conforms to the nationwide average could use Federal formula grants to offset 24.4 percent of its operating costs (100.0 - 51.2 = 48.8 x .5 = 24.4). Under the proposed change, the same transit authority could use formula grant funds to offset 43 percent of its operating expenses in 1982 and 34 percent in 1985.

3. The third proposed change would give a transit system additional funds--a bonus--if (1) it increased its ridership by 5 percent, even if the additional cost of doing so would be greater than the additional revenues produced, or (2) its ratio of operating revenues to operating expenses exceeded the national median, even if its ratio had deteriorated from the prior year.

Therefore, the proposed reforms, if approved by the Congress, would do more to encourage transit systems to expand capacity and services than it would to encourage them to improve their ratios of operating revenues to operating expenses.

In summary, although there are many potential benefits to be gained by transit service expansion, there is, in addition to the capital costs involved, the potential for significant adverse impacts in terms of operating costs, operating deficits, and government subsidies. The decision process regarding transit expansion needs to include considering both the potential benefits and the potential adverse impacts. A decision to encourage and fund transit expansion should include an acknowledgement of the potential adverse impacts and a determination that these adverse impacts represent a price governments are willing to accept to gain the benefits that transit expansion offers. For this to happen, the potential adverse impacts of transit expansion need to be fully aired and discussed.

CHAPTER 3

RIDESHARING: MORE FEDERAL INCENTIVES ARE NEEDED

In February 1980 the Secretary of Transportation, in conjunction with the President's National Task Force on Ridesharing, announced a goal of doubling, by 1985, the number of commuters who rideshare (carpool and vanpool) to work to about 40 percent (over 30 million people) of all commuters. Federal Government interest in increasing ridesharing has grown since the early 1970s. But the Federal initiatives in this area have not succeeded in getting large numbers of drive-alone commuters to switch to ridesharing because:

--State and local governments have been reluctant to fund ridesharing activities or to take actions to discourage drive-alone commuting.

--Most employers have been reluctant to actively encourage and assist their employees to rideshare.

--Most drive-alone commuters have not been motivated to change their commuting habits.

These factors remain as obstacles to increased ridesharing and will have to be overcome if the ridesharing goal is to be achieved.

RIDESHARING AND THE WORK TRIP

Ridesharing is the shared use of a vehicle for a similar trip. Public transit therefore is a form of ridesharing; however, most references to ridesharing focus on carpooling and vanpooling and that is our focus when we refer to ridesharing.

During World War II, the Federal Government encouraged carpooling because of gasoline and rubber shortages. This encouragement subsided with the end of the war, and until the early 1970s, Government promotion of ridesharing was quite limited.

Even when ridesharing was not heavily promoted, it seems to have been used frequently for commuting. For instance, 1970 census data shows that in SMSAs with populations of 250,000 or more, 5.2 million of the 43.3 million workers who commuted to work did so as automobile passengers. Thus,

assuming a carpool occupancy rate of 2.4 1/ people, about 8.9 million, 2/ or 20.5 percent of the commuters were carpooling. According to the Bureau of the Census study, "The Journey to Work in the United States: 1975," carpooling was used by 21.1 percent of all commuting workers nationwide in 1975--15.6 million of 73.8 million.

It appears that only a small change occurred in the percentage of workers carpooling between 1970 and 1975. However, because of the difference in categories--automobile driver and automobile passenger in 1970 versus drive alone and carpool in 1975--a true comparison is not possible and can only be estimated from available data.

No nationwide data exists on the incidence of carpooling since 1975. However, Bureau of the Census studies of the work trip in selected metropolitan areas in 1975, 1976, and 1977 provide some indicators about the carpooling level in these years.

In the 21 areas surveyed during 1975, carpooling was the commuting mode used by 18 percent of commuters. The degree of carpooling ranged from a low of 14 percent in the San Francisco-Oakland, California, area to a high of 27 percent in the Newport News-Hampton, Virginia, area. The 1976 survey of 20 areas showed carpooling accounted for 17 percent of work-trip commuting--ranging from 11 percent in the New York metropolitan area to 26 percent in Honolulu, Hawaii. Carpool commuting in the 20 areas of the 1977 survey was 18 percent. This survey included the four metropolitan areas where we did field work and for which we made a comparison of the changes in the ride-sharing level since 1970. The following table shows the number of people that carpooled and the percentage of all commuters that carpooled in these four urban areas in 1970 and 1977.

1/The carpool cccupancy rate in 1969 was estimated to be 2.4 people by the National Personal Transportation Survey.

2/5.2 million passengers ÷ 1.4 passengers/carpool = 3.7 million carpool drivers + 5.2 million passengers = 8.9 million carpoolers.

	1970 (note a)		1977	
	Number of carpool commuters	Percent of total commuters	Number of carpool commuters	Percent of total commuters
Boston, Mass.	204,022	20.7	176,000	18.9
Detroit, Mich.	273,485	19.1	235,000	15.7
Los Angeles, Calif.	413,655	16.1	452,000	16.4
Washington, D.C.	276,672	24.4	302,000	25.0

a/Estimated based on a 2.4 carpool occupancy rate and number of automobile passengers reported in the 1970 census. (See p. 26.)

Comparable data on work-trip commuting during 1978 and 1979 is not available; therefore, we can only speculate about changes that may have occurred during 1978 and 1979.

During 1978, automobile travel increased by 4.7 percent, and the average miles traveled per registered vehicle increased by about 2.1 percent over 1977. On the other hand, transit ridership (unlinked passenger trips) in 1978 was 4.5 percent greater than during 1977.

During 1979, automobile travel, as measured by roadway use, was 1.5 percent below 1978 levels and transit ridership increased by 6.7 percent over 1978 levels. Also during 1979, carpool matching services in several areas had a large influx of applications for carpool matching assistance during the period of gasoline shortages. For instance, the California Department of Transportation, in a January 1980 report on the effects of the 1979 fuel shortages in California, reported that during 1979 the number of applications requesting a ridesharing match list processed statewide increased by 215 percent over the number received during the same period during 1978--385,751 in 1979 versus 122,650 in 1978. Likewise, the areawide rideshare matching service for the Washington, D.C., metropolitan area reported a 367-percent increase in matching requests during 1979 over 1978--17,299 in 1979 versus 3,702 in 1978.

It seems reasonable to conclude that at least during the period of gasoline shortages in 1979, some changes occurred in the way people commuted to work. However, because measurement data does not exist, there is no way to

determine the extent to which reduced automobile use and increased transit ridership were related to the work trip as opposed to other more discretionary kinds of trips, such as shopping and recreational trips. Also not known is the extent to which commuting changes made during the gasoline shortages continued once gasoline supplies became adequate.

THE FEDERAL GOVERNMENT AND RIDESHARING

The current high level of Government interest in ridesharing began in the early 1970s when the Federal Government began promoting the ridesharing-to-work concept, encouraging State and local government actions to increase commuting by transit and ridesharing, and making Federal funds available for State and local government ridesharing activities.

Promoting ridesharing

In reaction to the 1973 oil embargo, the Federal Energy Agency, one of the predecessor agencies of DOE, launched a nationwide public service advertising and information dissemination effort to promote energy conservation. Ridesharing was one of the many actions the public was encouraged to take to conserve energy. Also, the agency actively promoted vanpooling by holding workshops for employers to encourage them to set up vanpool programs for their employees.

Since the 1973 embargo, DOT has used a variety of ways to bring nationwide attention to ridesharing benefits. Information on ridesharing concepts, activities, projects, and benefits has been disseminated to transportation planners, transit operators, employers, consultants, and State and local government officials through publications, technical conferences, and workshops. Through 1978, three nationwide public information campaigns centering on television and radio public service advertisements have been conducted to encourage the public to commute by transit, carpools, and vanpools. A fourth advertising campaign was begun in 1979. These information efforts have emphasized the reduced cost of commuting to the individual and the benefits to society of reduced congestion, pollution, and energy consumption.

Encouraging State and local governments

Aside from these promotional activities, the Federal Government's main approach has been to encourage State and local governments to promote and assist ridesharing and to take actions to overcome commuter preferences for driving

alone and to motivate shifts to ridesharing. These efforts are primarily carried out by DOT through its transportation systems management planning requirements. In addition, DOE, through its State Energy Conservation Program, and EPA, through its requirements for transportation control plans, also encourage State and local governments to act to increase ridesharing and decrease drive-alone commuting.

For the most part, all three Federal activities encourage the same types of transportation actions. Because they are transportation-related actions, decisions on suggested actions are primarily made by transportation components of local, State, and Federal governments.

Transportation systems management

The transportation systems management process, established in 1975, requires urban areas to develop short-range transportation plans to make better use of present urban transportation systems. The requirement encourages urban areas to take the following types of actions.

1. Improve transit services.

2. Encourage ridesharing.

3. Make mass transit and ridesharing more appealing by giving them preferential treatment through

   --reserved or preferential lanes on freeways and city streets;

   --exclusive lanes to bypass congested points; and

   --fringe and transportation corridor parking to facilitate transfer to transit, carpools, and vanpools.

4. Make driving alone less convenient and/or more costly and thus less appealing through

   --reduced parking availability;

   --diversion, exclusion, and metering of automobile access to specific areas; and

   --area licenses, increased peak-hour tolls, parking surcharges, and other forms of congestion controls and pricing for drive-alone commuters.

State Energy Conservation Program

DOE ridesharing efforts are primarily carried out through the State Energy Conservation Program. Its objective is to promote energy conservation and reduce the growth rate of energy demand in participating States. Program participation has been voluntary, but each participating State is required to develop and implement plans to reduce its projected energy consumption. The overall goal is to achieve at least a 5-percent reduction in projected energy consumption by each participating State by 1980. The program also provides for financial and technical assistance to carry out planned actions. Some direct Federal financial aid is available. To be eligible for this aid, each participating State must adopt and implement certain mandatory energy conservation measures. The required program measure for ridesharing is that the State must implement at least one of the following actions in at least one urbanized area (an area with 50,000 or more people or the largest area if none is that large).

--A carpool/vanpool matching and promotion campaign.

--Park-and-ride lots.

--Preferential traffic control for carpoolers and public transit.

--Preferential parking for carpools and vanpools.

--Variable work schedules.

--Improvements in level of service for public transit.

--Exemption of carpools and vanpools from regulated carrier status.

--Parking taxes, fee regulations, or surcharges.

--Full-cost parking fees for State and/or local government employees.

--Urban area traffic restrictions.

--Geographical or time restrictions on automobile use.

--Area or facility tolls.

Federal energy funds totaling $169 million were appropriated through fiscal year 1979. These funds were allocated by formula to States beginning in fiscal year 1976 to implement their plans. Only a portion of these funds was used for transportation measures, and reliable data was not available on how much was spent for transit and ridesharing activities. The budget authorization for fiscal year 1980 is $47 million. The kinds of transit and ridesharing measures being taken by the States are mainly promoting and assisting carpooling and vanpooling, establishing park and ride/park and pool lots, and making transit improvements.

Transportation control plans

EPA is responsible under the Clean Air Act for establishing national air quality standards to protect the public health and welfare. The standards set for two types of pollutants--photochemical oxidants and carbon monoxide--for which automobile emissions are a major source, are exceeded in many large urban areas despite new-car emission standards and controls over stationary sources of air pollutants.

If a city or State cannot meet established air quality standards with emission controls on stationary sources and automobiles, EPA requires that it prepare a transportation control plan showing the action it intends to take to achieve compliance. The measures available to the city or State consist of actions designed either to reduce the emissions from each car, such as emission systems inspection and maintenance programs for automobiles, or to reduce the number of vehicle miles traveled by automobiles. Measures to reduce vehicle miles traveled include

--programs for improved public transit,

--exclusive bus and carpool lanes,

--areawide carpool programs,

--control of onstreet parking,

--provision of fringe parking facilities,

--road-user charges or differential rates to discourage single-occupant automobile trips, and

--employer-sponsored ridesharing programs.

Funding is not available from EPA for implementing the transportation control plans, but Federal-aid highway and Federal mass transit funds can be used.

Since the initial standards were established following the 1970 act, the deadlines for compliance have been extented, but EPA continues to support transportation control measures.

The 1977 amendments to the act extended the deadline for compliance to December 31, 1982, with the possibility for an extension until 1987 if a State can demonstrate that it cannot meet the air quality standards by 1982 even after implementing all reasonably available measures.

Funding ridesharing

Following the 1973 oil embargo, the Congress passed the Emergency Highway Energy Conservation Act of 1974. The act authorized using Federal-aid highway funds to finance the cost of carpool demonstration projects on a 90-percent-Federal/10-percent-local basis.

Through the end of fiscal year 1977, 106 ridesharing projects in 96 urban areas in 34 States were approved by the Federal Highway Administration (FHWA) and received $14.4 million in Federal-aid highway funding. Project activities consisted primarily of (1) constructing or designating park-and-ride and park-and-pool fringe parking facilities, (2) promotional activities, and (3) carpool matching projects.

FHWA's evaluation report on the carpool demonstration projects indicates the following:

--Most of the projects were deactivated after about 1 year.

--At the end of 1977 about 35 projects supported by the program were still carrying out ridesharing activities.

--Of these 35 projects, 26 were characterized as comprehensive, continuing projects and most of these had been active from 1974 through 1977.

--The average annual costs for these 26 projects ranged from $20,000 to $660,000 and averaged $137,000.

The Federal-Aid Highway Act of 1976 deleted the December 31, 1975, termination date for carpool demonstration projects, which in effect indefinitely extended funding of such activities. As a result, Federal-aid highway funds are still available for ridesharing activities and remain the primary source of Federal funds for ridesharing. However, the Surface Transportation Assistance Act of 1978 changed the general matching basis from 90 percent Federal/10 percent local to 75 percent Federal/25 percent local when it set the matching ratio at 75/25 for projects funded by Federal-aid primary, secondary, and urban funds.

In March 1979 DOT initiated a National Ridesharing Demonstration Program that made $2 million available for a 2-year period to fund selected ridesharing demonstration projects. One objective of the program is to test untried approaches to ridesharing in areas of marketing, employer involvement, management, and incentives/disincentives. A second objective is to provide a greater inducement to States and urban areas to use Federal-aid highway funds for ridesharing. Through December 31, 1978, only $26.7 million in Federal-aid highway funds had been obligated for ridesharing projects.

The $2 million in demonstration funds will be used to accomplish the second objective by requiring project sponsors to commit $2 in regularly apportioned Federal-aid highway funds or mass transit formula grant funds (Federal plus local matching shares) for each $1 in demonstration funds. Thus, the $2 million in demonstration funds will result in spending $6 million on innovative ridesharing projects. Proposals for 38 projects requesting almost $6 million in demonstration funds were received. In August 1979 DOT selected 17 projects to receive the $2 million.

Despite these demonstrations and ridesharing demonstration projects funded by UMTA from its Services and Methods Demonstration Program, Federal-aid highway funds are still the principal source of Federal funding for State and local ridesharing activities.

The Secretary of Transportation's proposed Transportation Energy Efficiency Act called for $2.5 billion dollars--$250 million each for fiscal years 1980-89--to fund an Auto-Use Management Program directed at improving automobile use to conserve energy. Ridesharing programs would be eligible for funding under this program. The Congress had not authorized this program as of October 3, 1980. The Senate has passed a bill, S. 2720, containing some of the elements of the Secretary's proposal, but it contained no funding authorization for improved automobile

use projects. A House bill, H. R. 6417, would authorize $3.75 billion in grant funds during fiscal years 1981-85 for energy conservation projects that would include (1) providing preferential treatment for transit, carpools, and vanpools, (2) encouraging carpools and vanpools, and (3) creating fringe and corridor parking facilities. As of October 3, 1980, the House had not voted on the bill.

RIDESHARING AT THE LOCAL LEVEL

To get some idea about ridesharing activities during 1979, we obtained information on 45 urban areas with area populations (according to the 1970 census) exceeding 500,000. Information about the ridesharing activities in four of these areas--Boston, Detroit, Los Angeles, and Washington, D.C.--was obtained during visits to each area and is discussed separately. Information about ridesharing activities in the other 41 urban areas was obtained through telephone contacts with the people identified by FHWA as ridesharing coordinators in those urban areas. The telephone contacts were made during late August and early September 1979 at about the time gasoline supplies were returning to normal.

Ridesharing in 41 urban areas

Ridesharing programs and the degree of assistance available to potential ridesharers varied considerably among these 41 urban areas. The ridesharing coordinators representing 29 of these areas said that they have active ridesharing programs, 10 said they were planning to establish programs, and 2 said that their areas were not planning to establish an active program.

The information provided on the 29 active programs showed the following:

--Twenty-six provide matching services in addition to their promotional activities.

--Twenty-five have at least one person working full time on ridesharing.

--Only eight of the programs have more than five people working on ridesharing.

--Sixteen appeal to and provide assistance to both employers and the general public, 12 are limited to working through employers, and 1 is directed only at the general public.

Budget information was obtained for 21 of the 29 active programs. These 21 programs had annual budgets ranging from $22,000 to $900,000. The urban area (population 514,000) with a ridesharing program budget of $22,000 has been in existence since 1977, has only one staff person, provides no areawide matching services, provides technical assistance only to employers, and is establishing a third-party vanpool program. The urban area (population 1,238,000) with a ridesharing program budget of $900,000 has been in existence since 1975, has 9 full-time and 9 part-time staff employees, provides carpool/vanpool matching services for both employers and the general public, and provides technical assistance to employers. This latter program's promotional activities include media advertising, road signs, and distributing brochures and employer packages on ridesharing.

Boston

The ridesharing program for the Boston area, MASSPOOL, was initiated in August 1975 as part of a statewide program run by the State of Massachusetts. MASSPOOL's budget for its initial 2 years was $600,000, 90 percent of which was funded by FHWA from Federal-aid highway funds as a carpool demonstration project. MASSPOOL's goal is "to help as many Massachusetts employers as possible to engage in effective carpool and vanpool action programs which can serve as low cost transportation alternatives to single-occupant commuting across the State."

MASSPOOL's approach is centered on providing personalized technical assistance to large employers throughout the State. The major elements of this assistance include:

--Meeting with company officials and transportation coordinators to discuss ways to implement ridesharing programs.

--Providing employers with materials for a ridesharing program, such as posters, employee brochures, and matching materials.

--Providing employers with either computer tape copies of FHWA's carpool matching program or doing the matching for the employer.

--Arranging meetings between employers to aid intercompany carpool matching.

--Providing information and technical assistance on vanpooling.

In 1978 MASSPOOL received approximately $100,000 under DOE's State Energy Conservation Program.

MASSPOOL will receive a minimum of about $525,000 in new funding for fiscal years 1980-81 as a result of its being selected to participate in DOT's National Ridesharing Demonstration Program. The program calls for MASSPOOL to market and assist ridesharing with emphasis placed on residential commuters, travel corridors, and multiple-employer sites. This activity will be in addition to its previous efforts directed toward large employers.

Detroit

Detroit did not undertake any carpool demonstration projects under FHWA's program, and until late 1978, no government-sponsored ridesharing activities were underway in the Detroit area.

In late 1978 the Southeastern Michigan Council of Governments hired one staff person to contact employers and advise them of the benefits of an employer-based vanpool program and offer technical help to set up a vanpool program for their employees. Also, the transit authority for the Detroit area is conducting a vanpool program for an 18-month period to determine what problems exist in brokering third-party vanpool services.

Council of Governments transportation planners and other local officials believe that a promotion and matching program is needed, and they would like to establish a regional carpool matching and promotional program. They estimated that about $400,000 annually would be needed for a comprehensive, areawide ridesharing promotion and matching program. However, these officials said that because of other priorities, available highway and transit funds could not be used for such a program. They stressed that without additional Federal or State funds, a regional matching program would have to be deferred.

Los Angeles

In 1974 a consortium of the regional planning agency, Los Angeles County, the California Department of Transportation, and private industry set up and funded a nonprofit corporation, called Commuter Computer, to encourage ridesharing and provide commuters who apply with a match list of potential riders in their area.

Commuter Computer's efforts consist of a company marketing program and a mass media campaign. The marketing program

generates 75 percent of the applications received and represents the bulk of Commuter Computer's efforts.

Commuter Computer uses marketing representatives who canvass major employers (100 or more employees) in specific geographic areas. Typically, each marketing representative is responsible for about 400 major employers. The employers are encouraged to convince their employees to register with Commuter Computer and to appoint a coordinator within the company to work with Commuter Computer.

Commuter Computer's estimated costs for fiscal years 1978, 1979, and 1980 are approximately $1.2 million, $1.6 million, and $2.0 million, respectively. Its activities are funded jointly by the California Department of Transportation; the counties served by Commuter Computer; the Southern California Association of Governments; and the Atlantic Richfield Company, which has contributed $100,000 annually.

In July 1976 a vanpool program was established through the initiatives of the California Department of Transportation, Commuter Computer, and several private companies. The program's purpose is to encourage ridesharing by buying luxury vans and leasing them to groups of 8 to 12 people interested in riding together. Marketing and administrative services are provided through Commuter Computer, whose matching services also help form vanpools.

In August 1979 Los Angeles was selected under DOT's National Ridesharing Demonstration Program to conduct a "consumer coordinator" demonstration project. The project is directed at providing a more personal approach to promoting ridesharing and will have demand and supply components. The demand component will be consumer coordinators who will work within a company and help employers with information on and problem solving related to ridesharing. On the supply side, liaison persons will be provided between Commuter Computer and the transit and taxi operators. These liaison persons will provide information on their respective services to Commuter Computer and the consumer coordinators so that prospective ridesharers are aware of available alternatives.

Washington, D.C.

Ridesharing promotion and assistance in the Washington, D.C., area is carried out by Commuter Club, a service sponsored by the Metropolitan Washington Council of Governments' Transportation Planning Board and the Metropolitan Washington Board of Trade in cooperation with the U.S. General Services Administration.

Commuter Club was established just before the energy crisis of 1973-74 and receives financial support from the District of Columbia, the States of Maryland and Virginia, and FHWA. Commuter Club expenditures through fiscal year 1979 totaled $650,000, and its budget for fiscal year 1980 is about $100,000.

Commuter Club provides carpool matching services to employers, individual commuters, and community groups throughout the Washington metropolitan area. Applicants from these groups are integrated into a computerized system that provides them with names and work telephone numbers of potential poolers. Vanpooling assistance to employers and commuter groups is also provided.

DOUBLING RIDESHARING

In announcing the goal to double ridesharing by 1985, the Secretary of Transportation stated that several actions recommended by the National Task Force on Ridesharing 1/ would be taken. The announced actions include the following.

1. Task force members will contact top-level officials of major companies to encourage them to put ridesharing into effect for their employees.

2. DOT will establish a national ridesharing information clearinghouse for information on ridesharing and ridesharing programs.

3. FHWA will continue urging States to use more of their Federal-aid highway funds for ridesharing programs.

4. Each Federal agency will be required to name a transportation coordinator to aid employee participation in rideshare matching programs, help employees form carpools and vanpools, and publicize the availability of public transit.

1/The Ridesharing Task Force, which includes representatives of government, industry, and civic organizations that have been involved in establishing ridesharing programs at the local level, was established by the President in October 1979. It was challenged "to develop a comprehensive, coordinated program for promoting and establishing ridesharing programs across the Nation in both the public and private sectors."

For the most part, establishing an information clearinghouse is the only new action.

Previous ridesharing activities and programs have generally involved appeals to employers to establish carpool and vanpool programs for their employees. As discussed in the following section, these efforts did not result in a high degree of employer participation.

Since 1974 DOT has been encouraging States to use Federal-aid highway funds for ridesharing programs with only limited success. This latest effort will be different only in the sense that promoting ridesharing activities and increasing the use of available Federal-aid highway funds for carpool and vanpool programs and system improvements to facilitate high-occupancy vehicle use have been designated as a program emphasis area for fiscal years 1979 and 1980 by FHWA. The effect of this emphasis is that FHWA's field offices are directed to promote these activities in the States and encourage States to use Federal-aid highway funds for these activities. Also, each field office is required to report quarterly on the progress it has made. These actions are countered by another difference between the present situation and the situation before fiscal year 1979. The Federal/local matching ratio for the use of Federal-aid highway funds for ridesharing has changed from 90/10 to 75/25. Consequently, using Federal-aid highway funds for ridesharing now requires a larger local contribution. The Auto Use Management Program proposed by the Secretary of Transportation would be used to offset this increase in the local matching requirement.

Achieving the ridesharing goal may very likely depend on the willingness, that was not obvious from past efforts, of (1) local governments to fund comprehensive ridesharing programs and incentives and (2) employers to actively promote and assist ridesharing by their employees.

Reluctance to support ridesharing at the local level

Before a significant increase in ridesharing can occur, opportunities for ridesharing must exist, assistance must be available to potential ridesharers, and drive-alone commuters must be persuaded to switch to ridesharing. Efforts to increase commuter ridesharing have generally included encouraging local governments to establish and sustain ridesharing programs that would consist of

--promoting ridesharing by informing the public of its benefits and providing "how to" information,

--helping individuals find ridesharing opportunities through activities such as carpool matching,

--working with employers to get them to promote and assist ridesharing by their employees, and

--seeking to persuade drive-alone commuters to change their commuting habits by creating incentives for ridesharing and mass transit and/or disincentives to driving alone.

However, generally during the 1970s there was reluctance on the part of

--State and local governments to use Federal-aid highway funds to establish and sustain comprehensive ridersharing programs and

--employers to actively promote and assist ridesharing.

DOT's internal Ridesharing Task Force, in its May 1978 report to the Secretary, made the following statements.

> "Perhaps the major problem impeding the growth of ridesharing is the disinterest or inability of most State and local governments to spend Federal-aid highway funds on such activities * * *. The reason seems to be that State highway officials, in particular, assign a low priority to ridesharing and high priority to more conventional highway and mass transit projects."

* * * * *

> "The second major problem in ridesharing development is the financial and managerial concerns that inhibit employer and local government sponsorship of pooling programs. High program start-up costs are a prime factor discouraging their involvement, especially in vanpool programs. These costs tend to be understated in most programs and are rarely recouped. There is also little recognition of what it takes to overcome the social aspects of pooling which serve as barriers to employees' participation."

Reluctance of governments

Through December 31, 1979, a total of $68.3 million in Federal-aid highway funds had been used for ridesharing, as indicated by the following table.

Federal-Aid Highway Funding for Ridesharing Activities

	Through FY 1978	FY 1979	Oct. 1 to Dec. 31, 1979	Total
	----------millions----------			
Fringe parking for public transportation	$ 2.6	$25.1	$ 6.7	$34.4
Carpool facilities (carpool-only parking and carpool-only roadway lanes)	3.7	7.9	4.7	16.3
Projects for locating and informing potential carpool-riders of ridesharing opportunities	13.5	3.5	0.6	17.6
Total	$19.8	$36.5	$12.0	$68.3

The above schedule shows that about 50 percent of the money was used to construct fringe parking facilities related to public transportation service and another 25 percent was used for carpool facilities. Also, it shows that most of the money was spent during fiscal years 1979 and 1980 (71 percent). The amounts spent on ridesharing were minor considering that about $35 billion in Federal highway funds were available for fiscal years 1974-79.

Our report on DOT's transportation systems management requirement ("Stronger Federal Direction Needed To Promote Better Use of Present Urban Transportation Systems," CED-79-126, Oct. 4, 1979) indicated that Federal highway and mass transit funds are not frequently used to fund ridesharing activities because these activities cannot compete for funds against traditional transportation projects such as transit operating assistance, bus and railcar replacement,

and highway construction. These traditional projects are given priority because urban areas are hard pressed just to fund those projects that will keep their existing transportation systems maintained and operational. Also, large new construction and equipment purchases have widespread public and political support and result in more Federal dollars and employment opportunities in urban areas.

Reluctance of employers

Ridesharing promotion works best when employers are actively involved. However, employer involvement has a number of drawbacks that make employers reluctant to actively promote and assist ridesharing for their employees. These drawbacks include cost, diverted staff, and new liability risks. In its report to the Secretary, DOT's Ridesharing Task Force identified the following conditions that lead employers to avoid participation in ridesharing programs.

Start up costs--The start up costs to initiate company pooling programs are estimated to range from $25,000 to $50,000.

Administrative expenses--Day-to-day operation of pooling programs requires continuous diversion of management and capable staff to activities unrelated to the principal goals of the firm. These include time to match and assign new riders, do promotional work, and provide computer support. In the case of vanpool efforts, fares need to be set and collected. These tasks have been reported to range from a few hours to a few staff days or more per month. Further, recouping these costs is difficult; charging carpoolers is awkward and including such costs in vanpool fares discourages participation.

New liability and need for additional inusurance--Extra insurance is needed to cover contingent liability in case of accident in a sponsored van. This insurance may become a substantial cost, ranging from $400 to $1,000 annually per van, depending on variations in State rates and types of operation. Employers are also uncertain about what their liabilities might be by just becoming associated with a ridesharing program.

Possible labor problems--Employers fear that sponsoring vans will become a new negotiable item for increased labor benefits.

Break with precedents--Programs that provide strong incentives for ridesharing can upset established attitudes and practices that previously have accommodated the needs of employees who prefer to drive alone.

Workers' compensation--In most States, questions remain as to whether the trip is covered by workers' compensation if employers sponsor the vans; definitive judicial decisions are lacking.

An FHWA evaluation of the carpool demonstration projects it funded concluded that the lack of highly committed and active participation by private employers in the carpool matching and promotion process was the most serious barrier to the effectiveness of the ridesharing programs. The evaluation report stated that

> "* * * it appears that the single most influential factor impeding strong employer commitment to active participation was the absence of compelling reasons to increase ridesharing that would produce significant direct benefits to the company."

The evaluation report on the approximately 106 projects in 96 urban areas stated that:

--In the average urban area, 143 employers with about 25 percent of the urban area's work force agreed to participate, but the majority of these were passive participants who only opened their doors to the ridesharing organization to permit distribution of promotional materials and carpool matching applications.

--Only a much smaller number of employers gave high priority to the objectives and devoted substantial staff efforts to motivate their employees to join carpools.

--Generally, a small percentage of employers accounted for a high percentage of the employees that actually submitted carpool matching applications.

--Difficulties were experienced in sustaining a high level of interest and activity among employers who had initially made strong commitments to the ridesharing program.

Potential for ridesharing

A 1975 DOT report entitled "Carpooling: Status and Potential" estimates that approximately 27 percent of drive-alone commuters have to drive alone because they either use their cars in performing their jobs or they have

irregular work schedules. The report also provides an estimate, characterized as conservative, that the maximum potential for carpooling nationwide, preference aside, is somewhere between 47 and 71 percent of all auto commuters. The census survey of the 1975 work trip indicates that about 23 percent of auto commuters carpooled during 1975. Therefore, it would be possible to increase the number of auto commuters who rideshare by two to three times if the preference for driving alone could be overcome.

Benefits of increased ridesharing

The benefits of doubling the number of commuters who rideshare include reduced energy consumption, road congestion, and automobile emissions.

Energy savings

If the 15.6 million workers that shared rides to work in 1975 could be doubled by 1985 by shifting 15.6 million drive-alone commuters to ridesharing at the rate of 2.5 1/ persons per vehicle, approximately 1.92 billion fewer gallons of gasoline (equal to 125,245 barrels per day) would be consumed in 1985. Such a reduction is equal to about 2.3 percent of 1978 automobile gasoline consumption. As indicated previously, because of improving automobile fuel efficiency, the energy savings available from a shift of a like number of workers will decrease each year. For instance, if ridesharing could be increased in 1980 by a similar shift of 15.6 million commuters, about 30.2 percent more gasoline--2.50 billion gallons (163,079 barrels per day) versus 1.92 billion gallons--would be saved in 1980 than would be saved in 1985. In 1990, the amount of gasoline saved would decrease to 1.64 billion gallons (106,980 barrels per day).

Reduced congestion and pollution

Shifting drive-alone commuters to ridesharing would reduce the number of automobiles in rush hour traffic and would result in reduced automobile emissions. Assuming the 2.5 occupancy rate, a shift of 15.6 million drive-alone commuters to ridesharing would remove about 9.36 million automobiles from rush hour traffic daily. This amount is equal to about 16 percent of the estimated number of cars used to commute to work in 1975.

1/The carpool occupancy rate measured by the National Opinion Research Center's continuous survey of travel between November 1973 and February 1974.

Using the same illustrative trips as we did on pages 13 and 14, gross estimates of the emissions of hydrocarbons, carbon monoxide, and nitrogen oxide that would be avoided daily by eliminating 9.36 million round trip work trips are shown in the following table.

Estimates of Emission Reduction

	Hydrocarbons	Carbon monoxide	Nitrogen oxide
	----------(grams)----------		
Emissions per trip	48.7	778.3	46.5
Emissions for 9.36 million trips	456 million	7,285 million	435 million

As noted in chapter 2, the overall energy savings and emission reductions presented in the preceeding sections will be less if the automobiles left at home are used for other travel or used to drive to pick up points. (See pp. 11 and 12.)

CONCLUSIONS

Efforts to encourage and increase ridesharing during the 1970s have been hampered by the reluctance of local governments to use Federal-aid highway funds for ridesharing. This situation in turn has limited the efforts of local governments to promote and assist ridesharing. Many local governments seek to get employers to actively promote and assist ridesharing by their employees. However, most employers have been reluctant to do so because of the costs they would have to absorb and concerns over their potential liability and the possible effect on labor relations and negotiations. Yet, doubling the number of workers who rideshare to work is an ambitious goal that will require active support by local governments and employers.

Making Federal funding for ridesharing available on a categorical basis should increase active support for ridesharing by local governments. Without categorical funding, ridesharing, which does not have strong local constituencies, has had to compete with traditional highway and transit projects that do. Ridesharing projects have not done well in this competition. Separate funding would increase the chances that local governments would carry out an ongoing, comprehensive program for promoting and assisting ridesharing. In turn, a strong local ridesharing program should increase the possibilities of getting active employer support.

MATTERS FOR CONSIDERATION BY THE CONGRESS

The Congress should consider separate Federal funding of ridesharing activities for the following reasons.

--Separate Federal funding should help overcome State and local government reluctance to fund ridesharing activities since they would not be competing for Federal funds with the more conventional highway and transit projects that have strong local constituencies.

--Ridesharing is the only practical alternative to driving alone for most commuters.

--If serious gasoline shortages occur, ridesharing would have to become the predominant commuting mode.

--Doubling ridesharing would save at least three times as much energy as a 50-percent increase in transit commuting. Also, it would remove about 9 million automobiles daily from commuter traffic, avoid the exhaust emissions that 9 million daily round trips would produce, and make use of the available space in automobiles already on the road.

AGENCY COMMENTS AND OUR EVALUATION

DOT, in its August 26, 1980, letter, concurred with our findings that substantial energy and other benefits are possible through increased ridesharing and that additional Federal incentives are necessary for local governments to implement ridesharing programs. They believe the approach they proposed to the Congress in the auto-use management component of the Transportation Energy Efficiency Act is the most effective means of providing additional incentives. This approach seeks to encourage local governments to use more Federal-aid highway funds for ridesharing by using Auto-Use Management Program funds (if authorized and appropriated) to increase the Federal share to 90 percent for ridesharing and other eligible energy saving projects instead of the normal 75-percent share that applies to most noninterstate Federal-aid highway apportionments.

DOT believes that our assessment of the progress made in implementing ridesharing is premature and overly pessimistic. They said that Federal ridesharing activity is premised on a two-stage change process. In the first stage, local governments are persuaded to implement programs which promote and

facilitate ridesharing. In the second stage, as a result of local government programs, employers promote ridesharing and commuters shift from driving alone to carpooling and vanpooling. Both stages require a change in behavior, a process which in every area of human activity occurs slowly unless there is an extraordinary circumstance (for example, major shortages of gasoline) or major economic incentive. Thus, DOT said it should not be surprising that shifts of commuter travel to ridesharing would occur gradually.

DOE, in its August 29, 1980, letter, said that it believes that sound Federal programs to improve commuter vehicle occupancy are needed to achieve national energy conservation goals. It also said that if average automobile occupany for the work trip can be raised from 1.4 to 2 people, potential energy savings could be as much as 500,000 barrels per day--saving at least 10 times as much energy as a 50-percent increase in transit commuting. DOE further stated:

--It was concerned that too much emphasis is being placed on the ability of ridesharing matching organizations to increase commuter vehicle occupancy.

--It believes that employer-sponsored ridesharing programs represent the only approach that has been able to double and maintain ridesharing activity. However, many employers are reluctant to sponsor ridesharing programs because they are a non-revenue-producing overhead expense. They believe that a tax credit for employers sponsoring ridesharing programs might be a solution.

--Consideration should be given to placing greater emphasis on priority lanes and ramps for high-ocupant vehicles and requiring that all additional urban freeway lanes be reserved for high-occupant vehicles during rush hours.

--Vanpools are the Nation's most energy-efficient mode, and DOE supports consideration of tax incentives to rapidly expand all forms of vanpools.

--Mass transit and ridesharing programs are complementary means for achieving the Nation's energy goals and Federal policies should encourage both. Ridesharing has greater short-term benefits, and greater attention should be given to removal of institutional barriers and careful application of financial incentives.

EPA, in its August 18, 1980, letter, commented that ridesharing is a low-capital-cost alternative to reduce drive-alone commuting which can be quickly implemented and reduces energy consumption and air pollution.

We do not believe there is any basic disagreement between our views on ridesharing and the views expressed by DOT, DOE, and EPA in their comments concerning the potential benefits of ridesharing, the difficulty of bringing about a large shift of drive-alone commuters to some form of ridesharing, and the nature of the change process involved. We believe the specific actions DOE has suggested would contribute to bringing about the changes in human behavior that are necessary to achieve a large shift to ridesharing, namely

--creating incentives for employers to establish ridesharing programs,

--increasing the use of priority lanes and ramps for high-occupant vehicles,

--providing tax incentives for all forms of van-pooling, and

--removing institutional barriers to ridesharing.

Further, we agree with the DOT and DOE views about the critical role of employer sponsorship of ridesharing programs to the advancement of ridesharing.

We believe the establishment of ridesharing programs by local governments and employers has been sporadic and slow in occurring and that specific funding for ridesharing could quicken the pace of this happening. Also, given the benefits that would accrue from a large increase in ridesharing and the large role that ridesharing would have to play in the event of serious gasoline shortages, it is desirable to accelerate the establishment of ridesharing programs by local governments and employers in order to hasten the shift to ridesharing.

In our opinion, the establishment of comprehensive local ridesharing programs could hasten the establishment of employer-based ridesharing programs that are identified by both DOT and DOE as necessary to produce large shifts to ridesharing. A comprehensive local ridesharing program, in our opinion, should include the following elements.

1. A highly visible ridesharing organization with a full-time staff and a primary mission of (a) promoting, assisting, and facilitating ridesharing, (b) representing ridesharing within the local transportation planning process, and (c) coordinating ridesharing efforts with local highway and transit efforts.

2. A continuous marketing program directed at the general public.

3. A continuous marketing program directed at local employers that includes working directly with the employers to help them establish and operate ridesharing programs for their employees. This program should probably include assisting employers in (a) carpool/vanpool matching, (b) purchasing/leasing vans, (c) arranging subscription bus services, and (d) developing incentives for employee ridesharing.

4. A program for working with and through Federal State, and local governments and ridesharing organizations and interest groups to develop incentives and overcome obstacles to ridesharing.

5. A program for serving as a transportation broker to area commuters to help them find alternatives to drive-alone commuting.

A major obstacle to the establishment of such comprehensive ridesharing programs is the availability of funds to finance such undertakings. Presently, the scope of local ridesharing programs is generally determined by the amount of highway and transit funds that local transportation officials are willing and able to divert to ridesharing rather than on the basis of what is needed to produce large shifts to ridesharing. Although DOT's proposed approach--which would have the effect of reducing the local matching share for using Federal-aid highway funds for ridesharing--would make the use of Federal-aid highway funds more attractive, local governments would still be faced with diverting funds from projects with strong local support.

Providing funds specifically for the establishment and operation of comprehensive local ridesharing programs would eliminate the necessity for ridesharing to compete against highway projects for Federal-aid highway funds and, in our opinion, accelerate the establishment of comprehensive ridesharing programs and the pace of the change process to which DOT refers.

CHAPTER 4

OVERCOMING DRIVE-ALONE PREFERENCES

Most commuters chose to drive alone during the 1970s because it gave them a very personal form of transportation with the flexibility to alter their commuting trip at a cost they were willing to accept. Generally, drive-alone commuters will not change to transit or ridesharing until they perceive the cost and convenience of one of these alternative modes as preferable to that of driving alone. Actions that can be taken to motivate drive-alone commuters to change to transit or ridesharing consist of either

--making transit and ridesharing more convenient and/or less costly and thus providing new incentives for using transit and ridesharing or

--making driving alone less convenient and/or more costly, thus creating a disincentive to driving alone.

PREFERENCE FOR DRIVING ALONE

In general, drive-alone commuters prefer driving alone to transit and ridesharing because they perceive driving alone as being

1. Faster: Time is not lost picking up and dropping off others as is generally the case with ridesharing and public transit. (According to the census study of the 1975 work trip, the mean travel time to work was (a) 17.8 minutes for drive-alone trips--2.14 minutes per mile, (b) 23.2 minutes for carpools--2.04 minutes per mile, and (c) 39.5 minutes for transit--4.34 minutes per mile. The mean travel distance for the three modes was 8.3, 11.4, and 9.1 miles, respectively.)

2. More reliable: The drive-alone commuter does not have to depend on someone else to do something.

3. More convenient and flexible: Driving alone enables the individual to alter departure time and route as desired.

4. Less socially demanding: The individual travels in privacy, and thus social interaction with traveling companions is not necessary.

In the past, promoting transit and ridesharing has emphasized the cost savings that a drive-alone commuter could realize

by switching to either transit or ridesharing. At least through 1978, the cost-saving aspects of a switch to transit and ridesharing did not produce a large shift away from driving alone. The need for incentives for transit and ridesharing and disincentives to driving alone have been generally recognized as being necessary to produce a large shift away from drive-alone commuting.

The increases in gasoline prices since early 1979 have added to the cost of driving alone, unless the drive-alone commuter switched to a more fuel-efficient vehicle. Whether these increased gasoline prices will be sufficient to motivate large numbers (that is, about 19 million) of drive-alone commuters to switch to transit or ridesharing is unknown.

USE OF INCENTIVES AND DISINCENTIVES

As discussed previously, the Federal Government asks State and local governments to consider using incentives to encourage transit use and ridesharing and disincentives to discourage driving alone. For the most part, local government actions, to the extent they have been taken, have concentrated on providing incentives for transit and ridesharing and have generally avoided actions that would make driving alone less convenient and/or more costly. Appendix I provides information on how the four urban areas we surveyed used incentives and disincentives.

Fare incentives and preferential use of roadways by buses are two types of transit incentives that have been most frequently used. Incentives for ridesharing have centered on preferential roadway use by carpools and vanpools, but on a nationwide basis they have not been extensively used.

Transit fare incentives

Reduced-fare and fare-free transit is one way to improve the cost/convenience of transit to driving alone. In a number of cities fares were eliminated or reduced for a specific time period as part of a demonstration project to get people to try transit. However, eliminating or reducing fares generally leads to increased operating losses.

An approach being tried in Boston, Massachusetts (see p. 58.), and Washington, D.C. (see p. 61.), is to encourage employers to subsidize part of their employees' transit costs. In both areas, the employers are encouraged to sell transit passes to their employees through payroll deductions and to subsidize all or part of the cost of the

passes. The employers can, however, collect full cost from their employees. If employers could be convinced to subsidize all or part of their employees' cost of transit commuting, then the incentive for transit use could be provided with a less negative impact on operating revenues. The obstacle is getting employers to subsidize their employees' transit costs.

Preferential roadway use

A main objective of preferential roadway use by high-occupany vehicles is to encourage such use by reducing travel time for high-occupancy vehicle commuters during congested peak hours. If large numbers of drive-alone commuters would switch to higher occupancy vehicles, other benefits would be realized, such as reduced congestion and improved traffic operations for all vehicles, increased travel speeds, increased highway people-carrying capacity, and reduced auto emissions.

Preferential treatment techniques were initially directed toward buses but later expanded to other high-occupancy vehicles such as carpools and vanpools. Experimenting with preferential treatment began in the late 1960s. Some projects were capital intensive and required long lead times to implement, while others were relatively inexpensive and easily implemented. Several priority highway techniques discussed below have been shown to be effective in reducing travel time for high-occupancy vehicles (both buses and carpools), thus providing an incentive for ridesharing. These techniques are bus and carpool freeway lanes, metered freeway ramp bypass lanes, and reserved toll plaza lanes.

Separated bus and carpool freeway lanes

The technique offering the highest type of priority service is separated bus and carpool freeway lanes constructed on existing rights-of-way with access limited to high-occupancy vehicles. Some advantages of this technique are:

--Priority vehicles can operate at high speeds, which results in saving travel time and improving travel time reliability.

--Existing highway efficiency is not reduced.

--Operating costs are low.

--Restricted use by high-occupancy vehicles is easily enforced.

The major disadvantages are that the construction takes a relatively long time and requires a considerable capital investment (estimated to range from $3 to $5 million per mile).

One of the most successful preferential treatment projects in influencing high-occupancy vehicle use has been the 11 miles of exclusive reversible lanes constructed on Shirley Highway between downtown Washington, D.C., and Springfield, Virginia. These exclusive lanes were initially opened only to buses, for which new and expanded express bus service was established from park-and-ride lots set up along Shirley Highway. In December 1973 the reversible center lanes were opened to carpools of four or more people. Before opening the express lanes to carpools, peak-period inbound automobile occupancy averaged 1.35 persons. The average auto occupancy, counting both regular lane and express lane traffic, was measured at 1.71 persons per car during 1979. Travel time advantages to users of the Shirley Highway express lanes average between 10 and 15 minutes and are often significantly greater during the peak hour. By 1979 approximately 40,000 people commuting to work via Shirley Highway on a typical workday were doing so by bus (about 22,000) and four-or-more-person carpools/vanpools (about 18,000). During the morning peak hour, the express lanes carried only 28 percent of the vehicles but 70 percent of the inbound commuters. The San Bernardino Freeway Express Busway in California is another reversible center lane facility that has also generated large increases in transit and carpool/vanpool commuting.

For a period of time, these two projects were the only separated priority lane projects in existence. During 1977 physically separated roadways were opened in Pittsburgh, Pennsylvania (buses only), and San Francisco, California. Another roadway, I-66 in Northern Virginia, is scheduled to give high-occupancy vehicles exclusive use of the entire roadway during peak commuting hours. Other separated right-of-way projects are being considered for New York, New York; Pittsburgh, Pennsylvania; Hartford, Connecticut; Boston, Massachusetts; Los Angeles, California; and Portland, Oregon.

Nonseparated, concurrent flow freeway lanes

Nonseparated, concurrent flow freeway lanes also restrict the use of a freeway lane(s) to high-occupancy vehicles. But unlike the separated priority lanes, they are set off from the regular lanes only by signs, pavement markings, or plastic inserts in the pavement. Four major projects have been implemented in Los Angeles; Boston; Portland; and Miami, Florida.

Some smaller projects were also instituted in Boston, Honolulu, New York, San Diego, San Francisco, and on I-95 in New Jersey.

In Los Angeles and Boston, the projects were short lived, ending amid much controversy and dispute primarily because an existing freeway lane was taken away and rededicated to high-occupancy vehicle use. In Miami and Seattle, a new lane was added. Data on the results of the Boston, Los Angeles, and Miami projects indicates that (1) auto-occupancy rates increased on all three facilities (from 1.31 to 1.38 in Boston, 1.22 to 1.31 in Los Angeles, and 1.23 to 1.28 in Miami), (2) the number of carpools using the roadway in the three locations increased by about 70 percent at the three sites, and (3) travel time for users of the reserved lane decreased, but enforcement of the restricted use was difficult. These results suggest that this technique has some potential to increase ridesharing, but enforcement will be more of a problem than with separated freeway lanes.

Metered ramp bypass lanes

Preferential treatment has been implemented by constructing bypass lanes for buses and carpools on metered freeway ramps. Ramp metering uses signal devices to control the rate at which vehicles are allowed onto a freeway. The bypass lanes allow high-occupancy vehicles to go around the queue of automobiles awaiting access to the freeway. The only major installations of bypass lanes have been in Los Angeles; Minneapolis, Minnesota; and San Diego, California. The bypass lanes in Los Angeles have been found to be safe, relatively inexpensive, and acceptable to the public. Also, they were found to save carpoolers some travel time during peak periods. The main disadvantage is the possibility that ineligible vehicles will use the bypass lanes.

Reserved toll plaza lanes

As in the case of metered freeway ramps, time-consuming lines form at toll booths. With this type of congestion, carpools can be given preferential treatment by providing them with a bypass lane to reduce travel time. In addition to bypassing regular traffic, high-occupancy vehicles can be offered reduced toll or toll-free use of the facility as an added incentive. This technique has been used successfully on the approaches to toll facilities on the San Francisco-Oakland Bay Bridge in San Francisco. Using this technique might require new construction.

Bus lanes

As of August 1978, some 30 U.S. cities were using some kind of priority lanes for buses only. These include concurrent, contraflow, reversible, and median lanes on major roadways and city streets.

UMTA has concluded that these priority lane options have led to improved service; however, the reduction in travel time has depended on the route length, number of stops along the restricted portion of the route, and the level of enforcement.

Park- ide lots and express bus sevice

In addition to these different types of priority treatments, developing park-and-ride lots adjacent to preferential freeway facilities and providing new or expanded express bus service in conjunction with these facilities enhances their potential to encourage commuters to use mass transit and carpools.

Disincentives to driving alone

Some advocates of ridesharing argue that the preference for driving alone is very strong and that attempts to overcome it should consider actions that would discourage or restrict driving alone. Actions with potential for discouraging drive-alone commuting that are available to State and local governments include the following.

--Restrict or reduce the supply of all-day parking available.

--Use high parking prices to discourage low-occupancy automobile commuting.

--Set parking taxes and bridge and roadway tolls to penalize single-occupant vehicles.

--Eliminate free parking for employees.

--Restrict free use of selected roadways and free access to selected areas to high-occupancy vehicles during the commuting period. Use of such roadways and areas by single-occupant vehicles would require purchasing a license for low-occupancy use.

State and local governments have been reluctant to take actions that would limit drive-alone opportunities or increase

the cost of driving because these actions are perceived as unpopular and have no strong local constituency. The situation at the Federal level has been the same, where proposals to impose a large tax on gasoline or to ration gasoline in order to reduce automobile use have not been adopted.

UNCERTAIN IMPACT OF HIGHER GASOLINE PRICES

The impact of the 1979 gasoline shortages and rising gasoline prices on how people commute to work is not well known except in general terms. What is known is that when gasoline was in short supply, the convenience of driving alone was negatively affected because purchasing gasoline was inconvenient (that is, finding a gas station open and waiting in line to buy). As gasoline supplies returned to normal, these inconveniences were eliminated and the relative conveniences of driving alone, ridesharing, and mass transit returned to what they were before the gasoline shortages. One change has occurred--the price of gasoline at the pump has increased about 76 percent from a monthly average of $.6868 in January 1979 to $1.2106 in June 1980 (nationwide average for major brands of regular gasoline).

The unanswered question is whether gasoline prices are high enough to motivate large numbers of drive-alone commuters to switch to transit or ridesharing. Certainly, the higher gasoline prices have had an impact on automobile travel--roadway use and gasoline consumption were less in 1979 than in 1978. However, how the work trip was affected is unknown. We believe that higher gasoline prices are likely to have a greater impact on discretionary trips rather than work trips but will probably provide some motivation to long-distance commuters to either rideshare or switch to more fuel-efficient autos. However, the motivation will be much less for those drive-alone commuters whose daily commute uses relatively small amounts of gasoline (that is, fewer than 2 gallons). These latter commuters represent about 82 percent of all drive-alone commuters as illustrated by the following table, in which we estimate the fuel that would be consumed in 1980 based on 1975 work-trip distance distribution.

Drive-Alone Work-Trip
Distance and Fuel Consumption

One-way distance (miles)	Percent of drive-alone commuters (note a)	Cumulative percent	Round trip fuel consumption at 15 mpg (note b) (gallons)
Less than 1	8.7	8.7	Less than 0.132
1 to 2	16.9	25.6	Less than 0.267
3 to 4	18.8	44.4	Less than 0.533
5 to 9	23.5	67.9	Less than 1.2
10 to 14	13.8	81.7	Less than 1.867
15 to 24	12.1	93.8	Less than 3.2
25 or more	6.0	c/99.8	3.333 or more

a/Bureau of the Census study of the work trip nationwide in in 1975.

b/Average U.S. automobile fuel efficiency is estimated by us to be between 15 and 16 miles per gallon during 1980 based on DOT data.

c/Does not add to 100 because of rounding.

CONCLUSIONS

Commuters have demonstrated a strong preference for driving alone to work. Actions to overcome this preference and motivate drive-alone commuters to switch to transit or ridesharing have concentrated on giving high-occupancy vehicles--buses, carpools, and vanpools--preferential use of selected roadway facilities. Where tried, these techniques have caused some commuters to switch to transit, carpools, and vanpools. One priority technique--separated bus and carpool freeway lanes--has produced a large increase in transit use and carpooling along the few commuting corridors where this technique is used. The use of such techniques, however, has generally been limited. The alternative to incentives to ridesharing and transit would be disincentives to driving alone, but because of their perceived unpopularity, they have generally been avoided by local governments.

Approximately 19 million drive-alone commuters will have to switch to transit and ridesharing to achieve the transit and ridesharing goals announced by the Secretary of Transportation. Whether gasoline prices are high enough to motivate so many millions of commuters to switch from driving alone

is unknown. If higher gasoline prices alone are not enough, then achieving these goals will be likely to require more widespread use of incentives. Also, the use of disincentives may be needed.

USE OF INCENTIVES AND DISINCENTIVES IN SELECTED URBAN AREAS

During the course of our work we visited four urban areas (Boston, Detroit, Los Angeles, and Washington, D.C.) to determine what they had done or were considering in the way of incentives to encourage transit use and ridesharing and disincentives to discourage driving alone. The incentives and disincentives used in these four urban areas are presented below.

BOSTON

In 1974, 3,300 feet of Interstate Route I-93 was converted into a preferential bus/carpool lane to speed these higher occupancy vehicles through a congested merger point. Bus/carpool preferential lanes were also used on the Southeast Expressway in the downtown area but were abandoned after about 6 months because of the inconvenience caused to low-occupancy vehicles.

Since 1974 the Massachusetts Bay Transit Authority has been working with employers to sell transit passes at a discount through payroll deductions. The pass costs $16 per month and allows unlimited travel on the transit system. In 1978 the program had 781 participating employers with about 32,000 passes per month being purchased through these employers. The transit authority is now encouraging employers to subsidize the cost of the passes for their employees. As of August 1979, 31 employers were subsidizing the purchase of passes by 2,500 employees (1,500 employees have 100 percent of the cost subsidized and 1,000 have 50 percent of the cost subsidized). Also, the transit authority has influenced insurance companies to provide a 10-percent discount to transit pass purchasers on their automobile insurance premiums for property damage and collision.

The metropolitan area has made no concerted effort to discourage drive-alone commuting. In 3 of the area's 101 communities, some attempts have been made to reduce automobile traffic, such as freezing the number of available parking spaces in an area, better enforcement of parking laws, and limiting on-street parking to residents in selected neighborhoods.

The transportation element of the State implementation plan for the Boston region (required by EPA and adopted by the Metropolitan Planning Organization on December 22, 1976) for meeting air quality standards states that active and planned control measures will fail to produce compliance

with the ozone standards and that drastic measures such as gasoline rationing, limitation on the number of automobile registrations, or higher gasoline taxes would be needed to achieve compliance with EPA's ozone standard.

The transportation system management element of the area's transportation plan indicates that strong measures are needed to reduce congestion and conserve gasoline in the Boston area and suggests that the region consider programs of roadway-use tolls, parking management, and fringe parking. The suggested toll program would be designed to reduce peak-hour vehicular travel and travel in congested areas and could include preferential toll treatment for high-occupancy vehicles and lower tolls during off-peak hours. The suggested parking management program would include such techniques as freezing or reducing the number of parking spaces, setting higher parking taxes, and strictly enforcing parking laws. The fringe parking program would encourage and facilitate the development of fringe parking sites throughout the metropolitan area to facilitate ridesharing and public transit use.

A Metropolitan Planning Organization representative expressed the belief that it was unlikely the programs and actions suggested in the transportation plan will be implemented because these actions lack popular support.

DETROIT

No actions had been taken in the Detroit area to discourage drive-alone commuting or to give preferential treatment to high-occupancy vehicles. The transit system's sale of monthly transit passes at discounted rates was the only incentive being used in the area.

LOS ANGELES

The Los Angeles region has implemented a number of preferential treatment actions:

--Separated lanes reserved for exclusive use of buses and carpools for a distance of 11 miles on the San Bernardino Freeway (El Monte Busway).

--High-occupancy vehicle bypass lanes on 93 of the 373 metered freeway ramps in the Los Angeles area, which allow unrestricted access to the freeway by buses and carpools.

--Approximately 40 park-and-ride/park-and-pool lots with more than 6,400 spaces.

--A 1.4 mile contraflow lane for the exclusive use of buses in downtown Los Angeles.

The following actions are planned for the future:

--By 1983 the California Department of Transportation expects to have metered 1,000 freeway ramps and provided bypass lanes for high-occupancy vehicles at 400 locations.

--The California Department of Transportation plans to develop a freeway transit program that will initially have 37 miles of separated bus/carpool lanes and will later be expanded to 100 miles of separated lanes.

--Fifty additional park-and-ride/park-and-pool lots are planned to be built through 1985.

Efforts in the Los Angeles metropolitan area have emphasized improving the comfort, convenience, and feasibility of using transit and ridesharing and encouraging people to use these means for commuting to work. Aside from the Santa Monica diamond lane, no action has been taken to discourage driving alone in terms of restricting, penalizing, charging, or inconveniencing drive-alone commuters.

The Santa Monica diamond lane, which took one lane in each direction of the Santa Monica Expressway away from general traffic use and reserved it for buses and carpools, did cause considerable inconvenience for drive-alone commuters. The diamond lane decreased congestion and travel time for buses and carpools while increasing congestion and travel times for drive-alone commuters. This preferential bus and carpool lane caused considerable controversy and was abondoned after 5 months.

Some thought has been given to reducing off-street parking spaces, but parking management techniques have not been implemented on a large scale.

WASHINGTON, D.C.

One of the major attempts to increase transit use was establishing a network of bus lanes along major commuter roadways and within the District of Columbia to reduce travel time for area bus commuters. The most successful application has been the Shirley Highway exclusive lane facility, which was initially opened only to buses and for which new and expanded express bus service was established from park-and-ride lots set up along the Shirley Highway. Since December 1973 the reversible center lanes have been open to carpools of four or more people.

A 10-mile segment of Route I-66 being constructed between the Virginia suburbs and the District of Columbia will be restricted to use by buses, vanpools, and four-or-more-person carpools during peak commuting hours.

The Washington Metropolitan Area Transit Authority, in February 1980, started a transit pass program to encourage employers to provide transit service as a fringe benefit instead of parking spaces. The program entails employers selling passes to their employees through a payroll deduction with the employer paying none, part, or all of the cost.

Several actions have been taken in the region to discourage automobile commuting, especially drive-alone commuting, and most of these focus on parking.

--Four local jurisdictions have instituted residential permit parking programs that prohibit commuter parking in residential areas. The largest and most regionally significant program is in the District of Columbia--the program includes 11 neighborhoods comprising 800 blocks.

--Local governments in the metropolitan area have endorsed eliminating employer-subsidized parking. In November 1979 the Federal Government began charging Federal employees to park at Government-operated lots and garages. For the first 2 years employees will pay one-half the prevailing commercial rate; beginning in fiscal year 1982, they will pay 100 percent of the prevailing commercial rate.

--In 1978 the District implemented a comprehensive parking and traffic enforcement program to decrease the amount of illegal on-street parking in the city.

APPENDIX II

U.S. Department of Transportation
Office of the Secretary of Transportation
Assistant Secretary for Administration
400 Seventh Street, S.W.
Washington, D.C. 20590

August 26, 1980

Mr. Henry Eschwege
Director
Community and Economic
Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Eschwege:

We have enclosed two copies of the Department of Transportation's (DOT) reply to the General Accounting Office (GAO) draft report, "Increasing Commuting By Transit And Ridesharing: Matters For Consideration," dated July 18, 1980.

DOT generally agrees with GAO's findings with respect to direct energy savings of mass transit and ridesharing, but differs in areas of interpretation and policy judgement.

Most important with respect to the transit portion of the evaluation, DOT believes that transit improvements contribute indirectly to national energy goals through providing fallback capacity for use in the event of a severe gasoline shortage and through exercising an important underlying influence on the feasibility and success of ridesharing and disincentives to drive-alone autos. Without some basic level of transit service, ridesharing projects and auto disincentives would be less politically feasible and less likely to be successful if initiated by state/local governments. Thus, as part of a larger transportation package, transit improvements contribute to more significant energy savings than is accounted for by the GAO analysis. The Department agrees with GAO, however, that a Federal decision to increase transit capacity substantially should be based on an assessment of the entire range of benefits that are likely to be realized, not just the potential energy savings.

APPENDIX II

With respect to ridesharing, the Department concurs with GAO's findings that substantial energy and other benefits are possible through increased ridesharing and that additional Federal incentives are necessary for local governments to implement ridesharing programs. The Department believes that an approach which "leverages" existing Federal-aid highway funds, as proposed to Congress in the Auto-Use Management component of the Transportation Energy Efficiency Act, is the most effective means of providing additional incentives.

Sincerely,

Edward W. Scott, Jr.

Enclosures

APPENDIX II

DEPARTMENT OF TRANSPORTATION REPLY

TO

GAO DRAFT REPORT OF JULY 18, 1980

ON

INCREASING COMMUTING BY TRANSIT AND RIDESHARING: MATTERS FOR CONSIDERATION

SUMMARY OF GAO FINDINGS AND RECOMMENDATIONS

The General Accounting Office (GAO) report examines the energy-savings potential of announced efforts by the Department of Transportation (DOT) to (a) increase mass transit capacity and ridership by 50 percent and (b) double the number of people that use carpools and vanpools to commute to work. In September 1979, the Secretary of Transportation proposed legislation to the Congress ("The Transportation Energy Efficiency Act") to obtain funding and other authorizations for these efforts, which were proposed to be financed from the "Windfall Profits Tax" revenues.

With respect to mass transit, the GAO finds that energy savings from a 50% increase in transit capacity and ridership will be small--less than one percent (0.65%) of the gasoline consumed by automobiles in the United States during 1978. The GAO expresses additional reservations about an energy-based increase in transit capacity because:

(a) It is likely to contribute to long-term increases in annual operating deficits and require increased public subsidy.

(b) Transit cannot be used for commuting by most work-trip commuters because it is generally oriented toward serving central-city areas, while the majority of commuters (63%) work in either the suburbs or non-metropolitan areas.

(c) Adding more capacity for work trips will widen the difference in capacity utilization between morning/evening peak periods and the rest of the day and will contribute to increasing operating deficits.

(d) Staggered working hours, differentiated peak/off-peak fares, and disincentives against drive-alone commuting could increase transit ridership and energy savings without increasing transit's physical capacity.

The GAO observes, however, that increases in transit ridership may have other positive effects and that the Congress needs to weigh all these effects

against the costs of the proposed increase in transit authorizations. The GAO believes that the potential energy savings alone are not sufficient to justify the large transit expansion being advocated.

With respect to ridesharing, the GAO finds that a doubling of the number of commuters who use ridesharing could achieve an energy savings of about 2.4 percent of 1978 automobile energy consumption. In addition:

(a) Ridesharing is the only practical alternative to driving alone for most work-trip commuters.

(b) In the event of serious gasoline shortages, ridesharing would have to become the predominant commuting mode.

(c) Ridesharing would make use of the available people-carrying capacity of the private automobile without requiring an increase in physical capacity.

(d) Doubling ridesharing would remove about 9 million automobiles daily from commuter traffic, thereby decreasing congestion and automobile exhaust emmissions.

The GAO notes that efforts to encourage and increase ridesharing during the 1970's have been hampered by the reluctance of state and local governments to use federal-aid highway funds for ridesharing. Presently, the principal source of federal assistance for ridesharing is the federal-aid highway program, where ridesharing projects have not competed well in local project selection with more traditional highway projects which have stronger state and local constituencies.

The GAO believes that the low use of federal-aid highway funds by local governments to promote and assist ridesharing ($56.3 million spent on ridesharing during fiscal years 1974-1979, versus $25 billion in total federal highway funds over the same period) has, in turn, been a constraint on employer involvement in workplace ridesharing. The GAO, therefore recommends that Congress support separate federal funding for ridesharing.

With respect to both transit and ridesharing, the GAO points out that commuters have demonstrated a strong preference for driving alone to work. To overcome this preference, federal policies have advocated both incentives for switching to transit and ridesharing and disincentives to driving alone. Incentives have been utilized with some success by local governments, but disincentives have been avoided because of their perceived unpopularity. The GAO observes that achievement of the energy goals set for transit and ridesharing may require the use of disincentives as well as more widespread use of incentives.

SUMMARY OF DEPARTMENT OF TRANSPORTATION POSITION

The Department of Transportation generally agrees with GAO's findings with respect to direct energy savings of mass transit and ridesharing, but differs in areas of interpretation and policy judgement.

Most important with respect to the transit portion of the evaluation, DOT believes that transit improvements contribute indirectly to national energy goals through providing fallback capacity for use in the event of a severe gasoline shortage and through exercising an important underlying influence on the feasibility and success of ridesharing and disincentives to drive-alone autos. Without some basic level of transit service, ridesharing projects and auto disincentives would be less politically feasible and less likely to be successful if initiated by state/local governments. Thus, as part of a larger transportation package, transit improvements contribute to more significant energy savings than is accounted for by the GAO analysis. The Department agrees with GAO, however, that a federal decision to increase transit capacity substantially should be based on an assessment of the entire range of benefits that are likely to be realized, not just the potential energy savings.

With respect to ridesharing, the Department concurs with GAO's findings that substantial energy and other benefits are possible through increased ridesharing and that additional federal incentives are necessary for local governments to implement ridesharing programs. The Department believes that an approach which "leverages" existing Federal-aid highway funds, as proposed to Congress in the Auto-Use Management component of the Transportation Energy Efficiency Act is the most effective means of providing additional incentives.

POSITION STATEMENT

1. Mass transit

The Department of Transportation generally agrees with GAO's conclusion that a 50 percent increase in transit capacity and ridership will not, by itself, save substantial amounts of energy directly. The Department differs with GAO, however, in some areas of interpretation and policy judgement.

As an initial matter for clarification, the Department wishes to point out that its proposed increase in authorizations for programs of the Urban Mass Transportation Administration is intended not only to increase transit capacity for energy reasons, but also to protect and improve the existing capital investment in mass transit. The latter includes replacement of worn-out vehicles and facilities and modernization of existing rail systems. It should also be noted that the proposed transit funding increases will not only be directed to those areas with extensive, existing systems, but also will be used to establish viable levels of transit services in areas in which current service is rudimentary or nonexistent. Such investments will meet emerging demands, for both peak and off-peak service, and accommodate riders shifting from other modes.

GAO has noted that increased transit ridership may have other benefits than energy savings, including urban revitalization, employment effects, and reductions in pollution and traffic congestion. The DOT agrees and would add two energy-related benefits. First, additional transit capacity can be expected to alleviate severe mobility restrictions by providing a fallback in the event of severe gasoline shortfalls. Second, the Department believes that transit investments will contribute to long-run changes in land use and development which could be more energy efficient than present land use patterns. Beyond the energy benefits, investments in transit today are necessary to meet long-term changes in land use and lifestyle which are necessary as energy resources dwindle and as the population ages. Under these conditions, further shifts away from dependency on the automobile are inevitable.

Another major DOT reservation about the GAO evaluation relates to GAO's separation and analysis of strategies such as transit improvements, ridesharing support, and auto disincentives as discrete initiatives rather than as an interdependent and mutually reinforcing package of activities. If examined independently, as GAO has done, any one element of this package may appear less effective than when it is incorporated into a broader strategy. For example, transit improvements reinforce people's willingness to use ridesharing by assuring them that alternatives are available at those times during the workday or workweek when the carpool or vanpool is not available. Also, transit improvements can make it politically more acceptable for local governments to implement -- and easier for individual citizens to adjust to -- auto disincentives.

In one of GAO's areas of concern, that of potential increases in transit operating deficits and public subsidies, the Department is taking action. Important reforms were proposed to Congress in restructuring the UMTA Section 5 program: changing the apportionment formula to include a performance factor based on actual service provided; placing a sliding ceiling on federal subsidies to begin at 43 percent of operating expenses by 1982 and reach 35 percent by 1985; and providing bonus incentive funds to areas which increase ridership and have responsible fare coverage policies. In addition, UMTA now requires successful applicants for major transit improvements to demonstrate that they will have a stable and reliable source of funds to finance system operations. These conditions require that communities be prepared to commit the necessary financial resources for transit operations. UMTA is also moving to require all capital grantees to show how they will put in place a stable and reliable source of funds for operation and maintaining new equipment prior to approving applications for federal transit assistance.

2. Ridesharing

The Department of Transportation agrees with GAO's findings about the substantial benefits which are possible through increased ridesharing. DOT believes, however, that GAO's assessment of the progress made in implementing ridesharing is premature and overly pessimistic.

APPENDIX II

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Federal ridesharing activity is premised on a two-stage change process. In the first stage, local governments are persuaded to implement ridesharing programs which promote and facilitate ridesharing. In the second stage, as a result of local government programs, employers promote ridesharing and commuters shift from driving alone to carpooling and vanpooling. Both stages require a change in behavior, a process which in every area of human activity occurs slowly unless there is an extraordinary circumstance (e.g., major shortages of gasoline) or major economic incentive. Thus, it should not be surprising that shifts of commuter travel to ridesharing would occur gradually.

A major increase in DOT emphasis on ridesharing occurred within the past couple of years. As a result, in 1979 alone the states obligated over $41 million in federal-aid highway funds for ridesharing projects, as compared to only $19.8 million for all prior years. GAO's findings are weighted towards an earlier period and thus can not be expected to pick up the effect of this increase in project activity, which the Department expects will continue to increase.

Several areas of recent DOT support for ridesharing are not fully reflected in the report. They include:

(a) Availability of UMTA Section 5 funds for ridesharing;
(b) DOT development of a model state law to help overcome regulatory barriers to ridesharing; and
(c) DOT workshops designed to assist state and local government and private employers in implementing ridesharing projects.

Nevertheless, the Department agrees with GAO that additional incentives are necessary for local governments to implement ridesharing programs. To this end, the Department proposed to Congress the Auto-Use Management Program as part of its transportation energy program to help reduce dependence on foreign oil. The funding level for this program is proposed to be $250 million per year, much of which would be expected to be used for ridesharing projects. $200 million per year would be used to increase the Federal share to 90% for ridesharing and other eligible energy saving projects above the normal 75% share, which applies to most non-Interstate federal aid highway apportionments. This would provide a strong financial incentive to State and local governments, since local match would be reduced to 10% for eligible projects. Use of additional Federal funds to "leverage" the existing program in this manner is highly cost effective and preserves local discretion and program flexibility. The remaining $50 million of the proposed Auto-Use Management Program would be reserved as discretionary funding for innovative projects which would not otherwise be funded by leveraged federal-aid highway funds.

DOT believes that this is a more effective way of encouraging local ride-sharing projects than creating a categorical ridesharing program, which GAO seems to support. Its major advantage is that it is likely to cause state and local officials to expand a greater share of existing federal-aid highway funds on ridesharing without creating the inflexibility of a categorical program.

APPENDIX III

Department of Energy
Washington, D.C. 20585

AUG 29 1980

Mr. J. Dexter Peach
Energy and Minerals Division
U.S. General Accounting Office
Washington, DC 20548

Dear Mr. Peach:

We appreciate the opportunity to review and comment on the GAO draft report entitled "Increasing Commuting by Transit and Ridesharing: Matters for Consideration." The Department of Energy (DOE) believes that sound Federal programs to improve commuter vehicle occupancy are needed to achieve National energy conservation goals. The potential energy savings from additional ridesharing ranges up to 500,000 barrels per day.

The draft GAO report provides a logical, though very optimistic, analysis of the potential energy savings from a 50 percent increase in transit capacity and ridership. Unfortunately, estimates of the energy savings from increased carpools and vanpools resulting from the actions proposed were lacking. Similarly, consideration of other alternatives, i.e. commuter tax incentives and/or resolving institutional barriers, were not considered. Consequently, the cost effectiveness and energy savings to these alternatives if they were available to all commuters rather than to only big city commuters where areawide ridesharing programs exist, remain undetermined.

DOE believes this draft is a good start towards a complete analysis of the potential energy savings and cost effectiveness of various commuter conservation options. One general issue not considered in the analysis is that interest in ridesharing varies dramatically depending on gasoline availability. Any recommendations must be reflective of this.

The following discussion reviews the three sections, Transit, Ridesharing, and Overcoming Drive Alone Preferences and includes specific page references as appropriate.

I. Transit

We agree that under the most optimistic assumptions, the energy savings from a 50 percent increase in transit ridership might be 637 million gallons of oil (42,000 barrels of oil per day (B/D) in 1985. This is dwarfed by commuter automobile consumption of approximately 1,500,000 B/D. However, we note that the 42,000 B/D savings is based on two seemingly contradictory assumptions, namely a 50 percent increase in transit capacity (page ii, paragraph 4) accomplished with no additional fuel consumption (page 12,) fourth bullet). [See GAO note 1 on p. 74.]

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Assuming that the $16 billion (page i, third paragraph) increase in federal subsidies over the next five years for transit is required to foster a diversion of 3.1 million additional transit riders (page 12, paragraph 2), the cost effectiveness of such actions on energy grounds is questionable. Additionally, as assumed, it is unlikely that all transit ridership will be former single occupant automobile users: Some of the new bus riders are certain to come from carpools, some will drive to a transit pick up point, and the energy efficiency of the new bus routes will be questionable unless the buses maintain high load factors. DOE recognizes however, that mass transit provides non-energy benefits and that the long-term energy benefits of better mass transit are important, although difficult to quantify.

II. Ridesharing

We believe that doubling ridesharing would save at least ten times as much energy as a 50 percent increase to transit commuting rather than the threefold increase reported (page iii, bullet 3).(See attachment 1 for calculations.) [See GAO note 2 on p. 74.]

However, there is no evidence that doubling ridesharing can be achieved using existing approaches since not one city has ever reduced commuter automobile travel by as much as five percent by the techniques discussed.

We are concerned that too much emphasis is being placed on the ability of ridesharing matching organizations to increase commuter vehicle occupancy. The determination of success should not be based on number of applications requesting a ridesharing match list or multifold increases in matching requests in 1979, during the most recent oil shortage, over 1978 figures (page27, thirdparagraph). It should be based on new carpools formed, permanence of new carpools and measurable increases in the percentage of carpools operating urbanwide.

The report raised questions about the shifts in commuter modes during the 1979 gasoline shortage (page 27, last paragraph). Some indications can probably be derived by studying traffic count data on major highway corridors during shortages and comparing it with before and after data. We suspect that the vast majority of the actual shift to carpools occurred spontaneously where shortages emerged.

Under the Transportation Systems Management Section (page 29) another item should be added, deregulation of all commuter vehicles carrying 15 or fewer persons to and from work and removal of institutional barriers.

CS market research indicates that 63 percent of all commuters were interested in carrying other commuters if they could receive $100 per month towards their commuting costs. This is up from 14 percent when fares were not evisioned. A commuter who formerly drove alone could transport four riders at monthly rates of $25 to $40 per month depending on distance, etc., and pocket $100 to $160 tax free money. Our research indicates that over forty percent of the commuters believe it is probably illegal to collect a fare.

We feel that employer sponsored ridesharing programs represent the only approach which has been able to double and maintain ridesharing activity (page 42). However, many employers are reluctant to promote and assist ridesharing by their employees. Apparently much of this reluctance is due to the fact that a ridesharing program is a non-revenue producing overhead expense. We believe a tax credit for employers who sponsor ridesharing programs as proposed in a recent bill introduced by Senator Durenberger and others, the " Commuter Transportation Energy Efficiency Act of 1980," Section 401, may provide a solution to this problem.

III. Overcoming Drive Alone Preferences

A greater emphasis on priority lanes and ramps for high occupant vehicles (HOV) should be considered (page 53). On the Shirley Highway (I-395 in the Virginia suburbs of Washington, DC) express lanes, carpools with four or more persons have grown from 400 to over 4,000 in seven years with an overall increase in vehicle occupancy from 1.35 to 1.71 persons per car. This is also the number one vanpool corridor in the Nation and there is a significant spillover impact on other corridors which makes Washington, D.C. one of the top three vanpool cities in the Nation. Interestingly, virtually all of these vanpools started spontaneously without employer or ridesharing assistance. Consideration should be given to requiring that all additional urban freeway lanes be reserved for HOVs during rush hour.

An additional column should be added to the table, "Drive Alone Work Trip Distance and Fuel Consumption," to show the cumulative percent of vehicle miles traveled by the commuters (page 57). Commuters traveling 10 or more miles one way to work (32 percent of the total) use 68 percent of the miles traveled for commuting. This and the fact that vanpools are permanent are precisely the reasons DOE is striving to maintain the rapid growth of vanpools which are best suited for the commuter traveling at least 10 miles to work. Vanpools, the Nation's most energy efficient mode, have been doubling each year since the oil embargo and have grown much faster where promoted. We support the consideration of tax incentives to rapidly expand all forms of vanpools.

In summarizing, convincing even 10-20 million of the Nation's 50 million plus commuters who drive alone to share rides or use mass transit is a major undertaking. We believe mass transit and ridesharing programs are complementary means for achieving the Nation's energy goals and that Federal policies should encourage both. We do feel that ridesharing has greater short-term benefits and that greater attention should be given

Attachment 1

ENERGY IMPACTS OF INCREASING AUTO OCCUPANCY DURING THE TO-AND-FROM WORK TRIP

Input Data

- Current average occupancy level for to-and-from work trip = 1.4 1/
- % of passenger car $ travel for to-and-from work trip = 33.7% 1/
- Current (1980) passenger car Vehicle Miles of Travel = 1,098 x 10^9 miles 2/
- Average on-road mpg in urban travel = 13.0 mpg 3/
  (assuming most work trips are urban in nature)

Assumption

- Average occupancy can be raised to 2.0.

Methodology

1. 1,098 x 10^9 VMT x 33.7% = 369 x 10^9 VMT for work travel at 1.4.
2. 369 x 10^9 VMT x 1.4 persons/vehicle = 517 x 10^9 PMT for work
3. $\frac{517 \times 10^9}{2.0 \text{ occupancy}}$ = 259 VMT of work travel at 2.0.
4. 369 VMT
   -259
   110 VMT reduction
5. $\frac{110 \text{ VMT}}{130 \text{ mpg}}$ = 8.5 x 10^9 gal. = 550 x 10^3 B/D saving

Reference

1/ U.S. Federal Highway Administration, DOT Nationwide Personal Transportation Study (1969) Report #1 and #7 (as reported in 1978 MUMA Facts and Figures).

2/ "Light Duty Vehicle Fuel Consumption Model", 1st. Quarterly Report, June 1980, Office of Conservation, PE/DOE, prepared by EEA Inc.

3/ "The Development of Urban Fuel Economy Estimates for Light Duty Vehicles" Interim Report, July 25, 1980, Office of Conservation, PE/DOE, prepared by EEA, Inc.

to removal of institutional barriers and careful application of financial incentives.

We appreciate the opportunity to comment on this draft report.

Sincerely,

P.M. Marshall Ryan
Acting Controller

Attachment
As stated

GAO note 1: Page references in this letter have been changed to correspond with page numbers in our final report.

GAO note 2: The difference in energy-saving calculations results primarily from different assumptions about the change in average vehicle occupancy that would result from a doubling of ridesharing.

APPENDIX IV

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460
AUG 18 1980

OFFICE OF
PLANNING AND MANAGEMENT

Mr. Henry Eschwege
Director, Community & Economic Development Division
United States General Accounting Office
Washington, D.C. 20548

Dear Mr. Eschwege:

The Environmental Protection Agency (EPA) has reviewed the General Accounting Office (GAO) draft report entitled "Increasing Commuting By Transit And Ridesharing: Matters For Consideration."

EPA believes the report describes the current problems accurately, and it suggests increasing Federal support for ridesharing programs. Ridesharing, a low-capital cost alternative which can be quickly implemented, reduces energy consumption and air pollution. However, GAO's comparative analysis of mass transit versus ridesharing may lead to unfortunate and unjustified conclusions which underestimate both the value and potential of transit systems. Basically, the report implies that the energy crisis has put emphasis on support for transit programs beyond their real economic value.

While transit's energy conservation potential may have been oversold, EPA agrees with GAO's observation that:

> Transit capacity expansion can, however, have some positive effects on urban revitalization, employment, pollution, and congestion. The Congress needs to weigh all these factors against the costs of the proposed expansion of transit capacity.

Our biggest concerns are obviously with pollution and congestion. The fears arising from the recent transit strike in New York City of "Gridlock," "Spillback" and dangerously unhealthy carbon monoxide levels underscore our concern about the inescapable relationships of mass transit, pollution and congestion.

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Although the report argues against transit when compared to ridesharing, it does not recognize that different forms of transit vary in efficiency and effectiveness in meeting different urban transportation needs.

For instance, in a densely populated urban area with narrow streets (such as in older Eastern Seaboard cities), refurbishment of subways to increase through-put and attract more clientele might be the most appropriate way of providing better transportation service. However, light-rail vehicles (trolleys) and bus systems have been determined to be more efficient in less densely populated corridors. The report should emphasize the distinctions between transit modes, their relative efficiency in terms of energy and cost, and their varying appropriateness for serving different types of transportation needs.

The report understates the advantages of refurbishing and improving existing systems rather than building new systems. We believe that previous mass transit funding programs have favored projects having high capital costs and have neglected basic maintenance. We are now confronting the results of years of this neglect. Maintenance now is both urgently needed and extremely expensive. The continuous cycle of loss of ridership, fare increases and service deterioration is the concern facing many metropolitan transit systems. The basic cost-benefit approach in the report, if taken out of context, might accelerate this cycle and the general demise of urban transit systems. In its suggested de-emphasis of transit funding, the report should consider more thoroughly what the loss of transit systems would mean to major metropolitan areas.

One productive approach, in our opinion, is the Urban Initiatives Program guidelines prepared by Urban Mass Transportation Administration (UMTA), which UMTA published on April 10, 1979, in the Federal Register. A copy of our comments on those guidelines is enclosed for your information. When EPA reviewed the guidelines we expressed our full support for this program and its potential value in increasing public access by emphasizing intermodal transfer improvements. Furthermore, UMTA's program provides a latitude and flexibility to the local applicant to promote multiple use of transportation facilities and thereby better integrate transportation with other aspects of metropolitan activity. These measures significantly improve the quality of transportation. The most unfortunate aspect of the UMTA's program was its relatively limited funding, i.e. $200 million each fiscal year.

In considering increased funding for mass transit, Congress should be reminded of the Clean Air Act's section 110(C)(5)(B) "Basic Transportation Needs" requirement:

> The FY 1982 clean air plans must "include comprehensive measures to: (i) establish, expand, or improve public transportation measures to meet basic transportation needs, as expeditiously as practicable; and (ii) implement transportation control measures necessary to obtain and maintain National Air Quality Standards. The revised plan shall, for the purpose of implementing such comprehensive public transportation measures, include requirements to use (insofar as necessary) Federal grants, State or local funds, or any combination of such grants and funds as may be consistent with the terms of the legislation providing such grants and funds."

The FY 1979 clean air transportation plans for many urban areas have included mass transit improvements that will require UMTA support in excess of current funding levels. Congress should address the fact that resource requirements for mass transit under the Clean Air Act will have to be reconciled with the mass transit appropriation.

There are two major reasons why the Agency believes the report is incomplete. First, one of UMTA's comments, supported by the Agency, is a clear indication of the report's limitations. The comment reads as follows...

> "While UMTA agrees with the figures concerning the energy savings from transit, it is not fair to single this out compared to other benefits of improved transit service. The tone of the report is liable to weaken support for transit which is badly needed by urban areas for a variety of reasons. In fact, what needs further examination is not only current transit service, but also what additional service or service to different areas than those now served may be needed to get commuters out of their driving-alone commuting pattern."

Furthermore, the report inadequately addresses the full range of transit options available on an area-specific basis and thus reaches misleading general conclusions on transit's benefits.

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Despite GAO's claim to the contrary, the fact that 37 percent of all work trips to the central business district (CBD) can potentially be served by mass transit is significant, especially in cities like Manhattan, Boston, and Chicago where minor shifts back to driving can have serious pollution and congestion consequences.

We believe the GAO report might include the following matters for consideration by Congress:

- full consistency between transportation funding in new legislation and transportation requirements in the Clean Air Act;
- more thorough evaluation of innovative funding methods for mass transportation improvements;
- transportation funding legislation which provides more latitude so each applicant can best direct formula funds to its particular needs.

This would allow transit agencies to develop the most effective approaches to increasing the quality of transit and thereby attracting more riders. If this can be achieved, then transit might better realize its potential as a major structural component in the cities it serves.

We appreciate the opportunity to comment on the contents of the draft report.

Sincerely yours,

William Drayton, Jr.
Assistant Administrator for
Planning and Management

Enclosure

APPENDIX IV

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D C 20460

JUN 15 1979

OFFICE OF THE
ADMINISTRATOR

UMTA Docket No. 79
Urban Mass Transportation Administration
Room 9320, UCC-10
400 Seventh Street, S. W.
Washington, D. C. 20590

Dear Sir:

The U.S. Environmental Protection Agency (EPA) appreciates the opportunity to review the guidelines for the Urban Mass Transportation Administration's Urban Initiatives Programs which were published in the April 10, 1979 Federal Register.

We applaud your program, and we strongly support attainment of its objectives. Private automobiles make up the majority of current transportation usage in metropolitan areas and they are major sources of both air and noise pollution. To reduce this source of pollution, we must develop safe, reliable, convenient, and attractive alternatives to automobiles. EPA offers the following suggestions to increase the Program's scope and address its's potential environmental impacts more thoroughly.

Scope of Urban Initiatives

The guidelines for the Urban Initiatives Program complement traditional mass transportation planning by emphasizing such types of eligible projects as intermodal transfer and multiple-use facilities. By making the change between different modes of transportation easier, the Program can be effective in reducing of the basic inconveniences characteristically felt about public transportation. Similarly, the Program's emphasis on multiple-use facilities may be an important method of physically blending public transportation with other urban activities, bringing people and public transportation together. These innovative types of projects, if appropriately integrated into existing systems, might be powerful factors in increasing public acceptance and use of mass transportation.

Special Consideration of Environmental Impacts

The types of facilities the Urban Initiatives Program is designed to promote may require special attention to impact assessment and mitigation. Intermodal transfer facilities, transit malls, and multiple-use facilities all infer a juxtaposition of different activities. In planning a successful facility project, sponsors should be sure that the physical impacts of one activity will not interfere with adjacent activities, defeating the very purpose of the facility's design. For instance, the noise and air pollution from badly maintained buses may discourage pedestrian usage on a transit mall, thereby blighting retail shopping private investment anticipates in its participation.

Further development of the Program's facility planning may need to include special research into: (1) the effects of pollution at very short distances between emission and reception and (2) more vigorous criteria for specific sensitive types of activity. Furthermore, research into and subsequent use of maximum pollution reduction methods may be justified, even with extra project costs, where the presence of such pollution might inhibit either public acceptance or private investment for the facility.

Air Quality Planning Considerations

The President's urban policy message of March 27, 1978 included an announcement of his intent to simplify, consolidate and coordinate Federally administered planning programs. This intent was partially realized in June 1978 when EPA and DOT jointly issued "Transportation-Air Quality Planning Guidelines" and in December 1978 when both agencies announced the initiation of the Urban Air Quality Planning Grant Program, which is administered jointly by EPA and UMTA. One of the main objectives of these planning grants is "to assist urban areas in accordance with the President's Urban Policy by integrating related Federal programs and providing means to achieve clean air goals and economic growth."

Furthermore, the Clean Air Act Amendments of 1977 require: (1) in those areas which will not attain air quality standards by December 1982, that the State Air Quality Implementation Plan (SIP) include measures to establish, expand, or improve public transportation measures to meet basic transportation needs (section 110(c)(5)); and that Federal agencies and

We believe that reducing the inconvenience and confusion of modal transfers and uniting transportation with the rest of the urban life to be essential to the viability and increased public acceptance of mass transportation.

Although the specific appropriation of the Program is limited, its objectives and emphasis should be incorporated into other UMTA and Departmental activities to the degree possible. For instance, intermodal transfer and multiple-use considerations should be increasingly applied as planning and design criteria in other Section 3 grants. Such criteria might even be applicable to Federal Aid and Interstate Highway funding when it directly relates to rubber-tired transit or carpooling and vanpooling.

Similarly, the Program's emphasis and objectives to better correct transportation systems and their environs might be productively applied to the priority-setting procedures such as evaluation and approval of transportation improvement programs (TIP's) and Transportation System Management (TSM) plans. Whether by reference or incorporation, the innovative approaches of the Urban Initiatives Program should become an integral part of normal transportation planning, facility construction, and operations.

In order to ultimately achieve the maximum diversion from private auto use and consequent pollution reduction, we would also suggest that all surface modes of transport be initially considered in planning the Program's facilities. For example, there has been a tremendous increase in the use of bicycles in urban areas for a variety of reasons, including health maintenance, recreation, and straight forward practicality. Furthermore, bicycles are an excellent mode choice for the shorter distances and limited parking spaces characteristic of urban areas. The environmental and energy benefits from increased use of this mode should be encouraged by providing safety and convenience to bicycle riders throughout planning and design of the Program's facilities. Similar planning attention to preferential treatment for carpooling and vanpooling should also be considered. The eligibility for bicycles, carpooling and vanpooling facilities within the Program funding should be specified section by section in the Guidelines (e.g., IV: A.1, B.1, and C.1).

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departments conducting or supporting programs with air quality - related transportation consequences shall give priority, consistent with statutory requirements, to the implementation of measures in approved or promulgated air quality plans (Section 176(d)). This "priority" requirement of section 176 "extends to, but is not limited to, authority exercised under the Urban Mass Transportation Act, Title 23 of the United States Code, and the Housing and Urban Development Act."

In recognition of these requirements, we believe that UMTA's Urban Initiative Program should give special consideration to those projects resulting from the transportation-air quality planning process funded by UMTA and EPA. The need to identify such projects should be included in Section V., C.; "Special Considerations," in the proposed Urban Initiatives Guidelines.

We hope these comments will aid you in development of final guidelines which will help to insure the Program's success. If you have questions or if we can be of further assistance, you may wish to contact Mr. Sam Little of my office directly at 755-0780.

Sincerely yours,

William N. Hedeman, Jr.
Director
Office of Environmental Review

(345540)

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